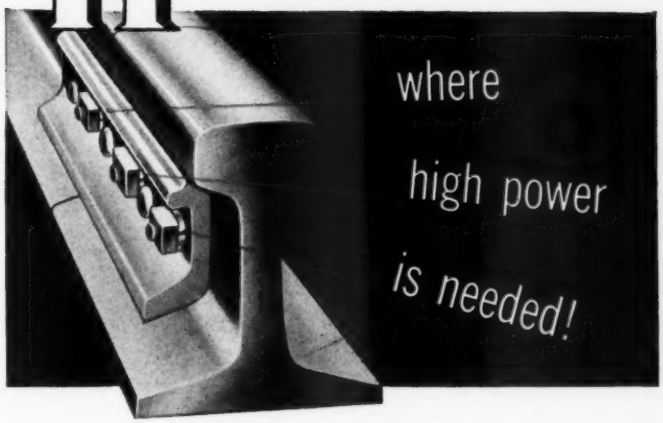
AUGUST 1958

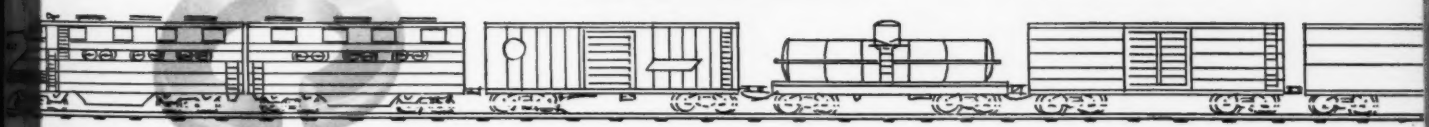
RAILWAY TRACK and STRUCTURES

A Simmons-Boardman TIME-SAVER Publication

Improved

HIPOWERS





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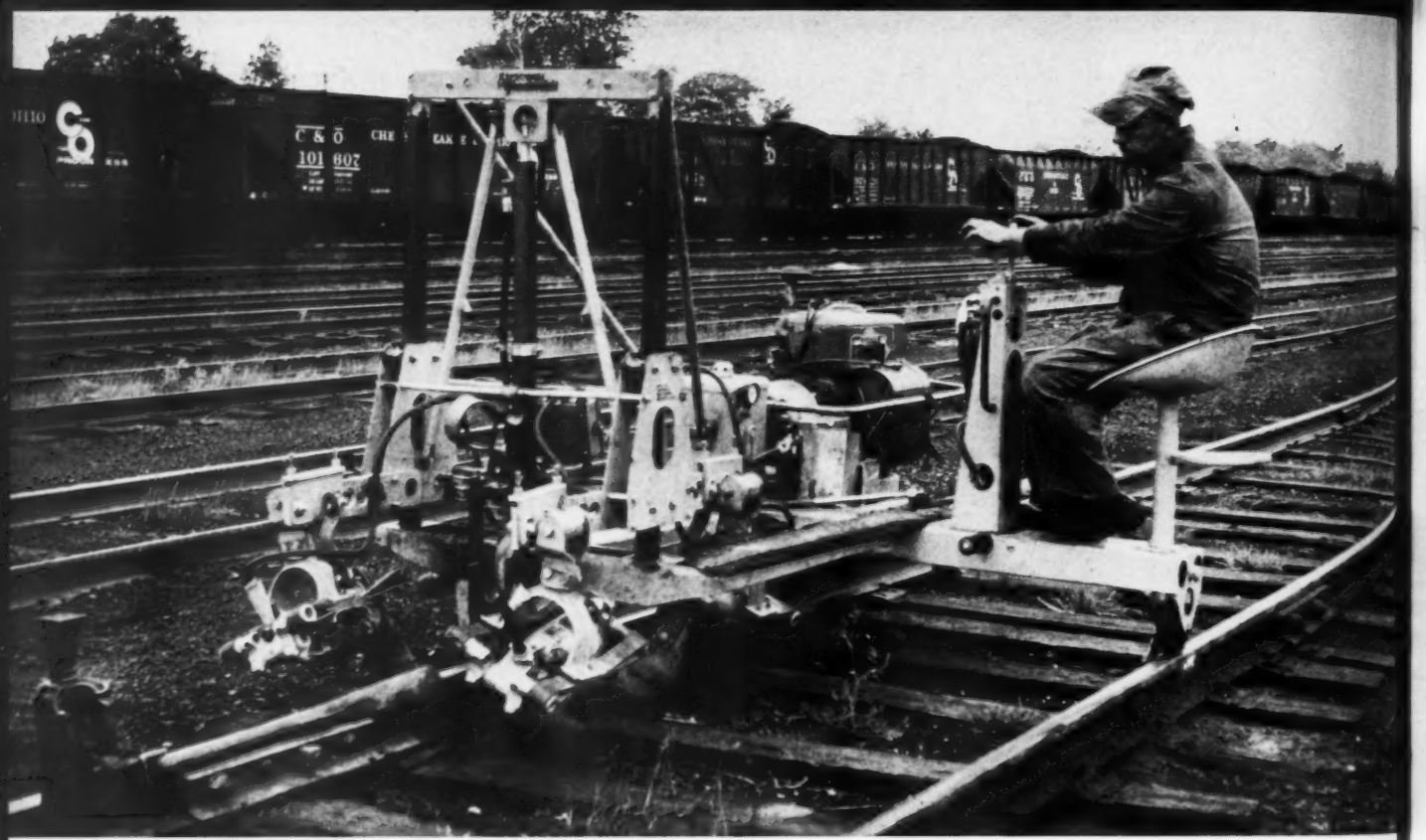

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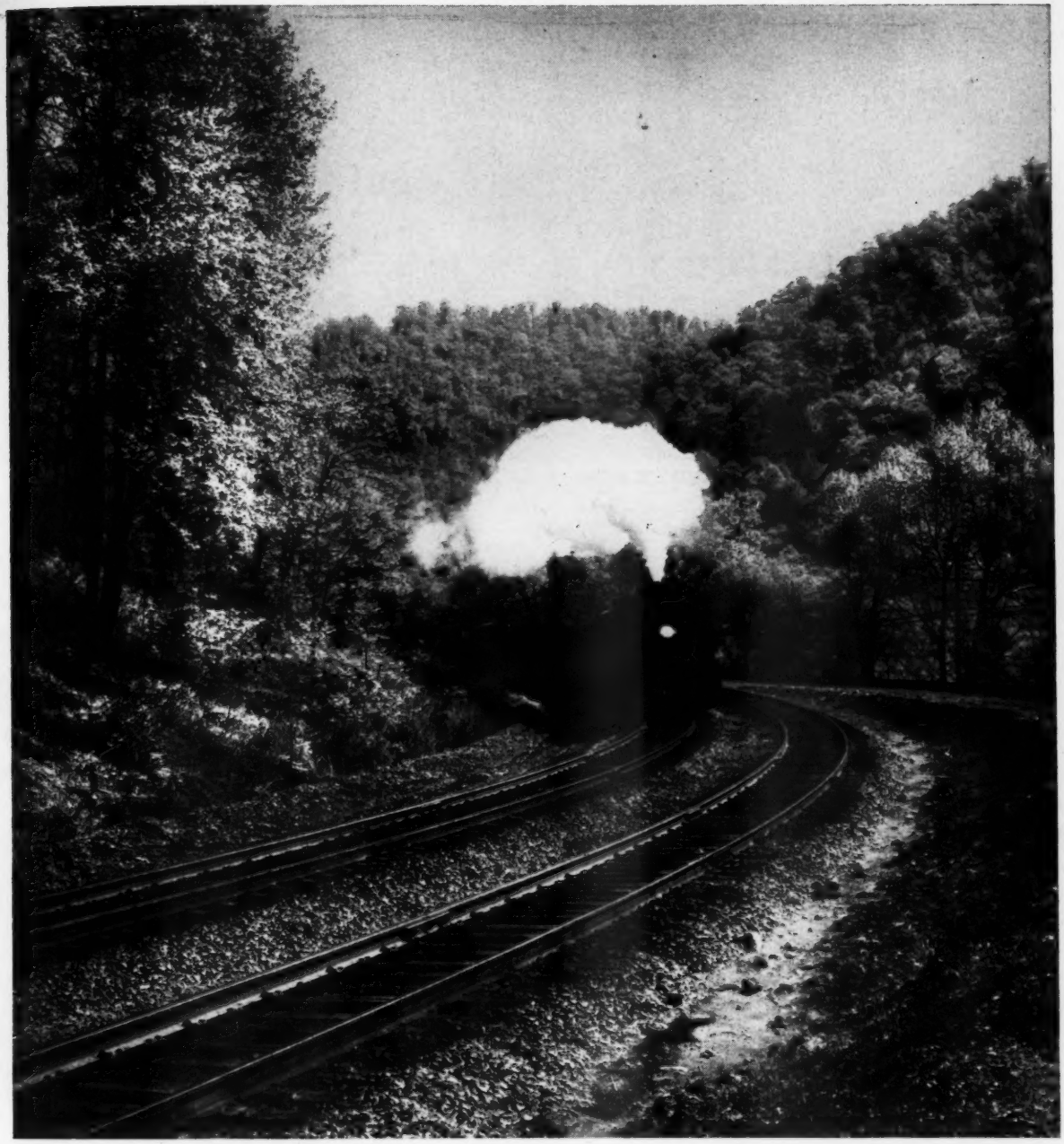

HEAT-TREATED RAILS . . . *a proved road to savings*

Surely this is a day of cost-cutting for U.S. railroads. And heat-treated rails offer a proved way to cut costs. (See article, *Railway Track and Structures*, March, 1958, p. 55.)

The rails discussed in the above-cited article are Bethlehem rails. And the new rails to be purchased by the railway featured in the article are to be heat-treated rails made by Bethlehem.

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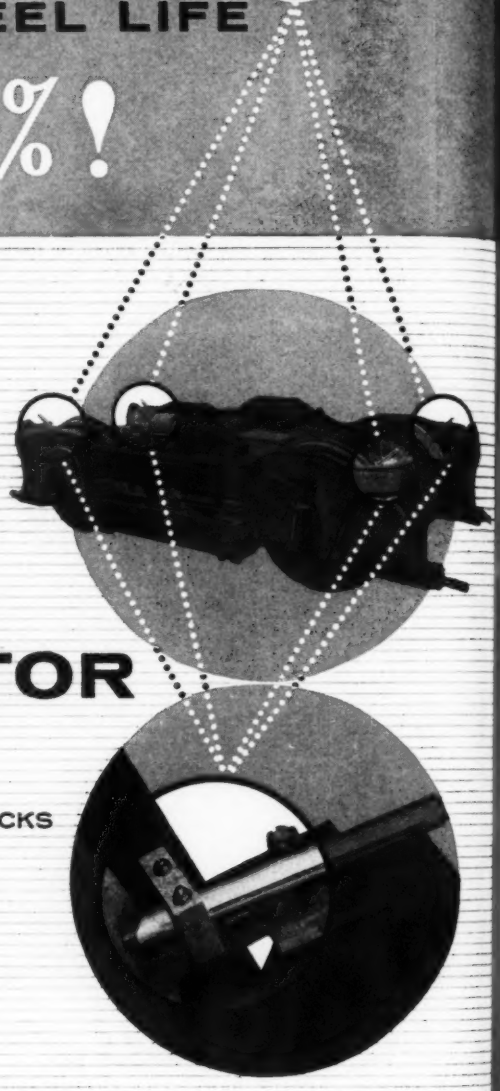

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Slide plates used under long truss spans 21

Expansion rollers under 15 pin-connected trusses are replaced by graphite-impregnated bronze-alloy slide plates.

New machine on Santa Fe burns weeds with propane 24

Burner is reported to do a complete job of destroying vegetation, regardless of how green it is, without leaving residue.

They find many jobs for this large truck crane 26

Fifteen-ton unit is kept busy doing various types of work on the Fargo division of the Northern Pacific.

More life for these spike-killed ties 28

Expenditure of $2 million is indefinitely postponed by replating spike-killed ties and applying Macbeth anchor spikes.

Should frog and switch designs be standardized? 30

Manufacturers and maintenance officers express their reaction to a proposal bearing on this vital question.

Two jobs for crawler-excavator 32

Tells how machines of essentially the same type were used to advantage in a tunnel and for improving drainage in a yard.

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DON'T MISS . . .

Long viaduct with about one million square feet of surface was recently protected with a new coating. Special spray equipment and powered staging enabled a crew of a foreman and eight men to cover the structure in 15 weeks at 40 per cent of the cost by conventional methods.

. . . in the September issue

Five operations in a one-man machine with ...

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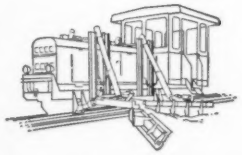
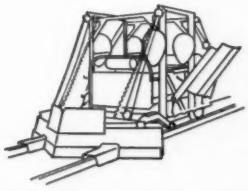
THE FAIRMONT W23 SERIES A BALLAST MAINTENANCE CAR is designed to shape and equalize shoulders . . . disc . . . scarify . . . sweep ballast . . . and plow ballast into or out of the center track area. It accomplishes five essential jobs with the labor of only one man—the operator! With this multi-purpose machine, he can fill in shoulder low spots . . . break up mud dams . . . improve drainage . . . uproot weeds . . . and get smooth, steady operation in heavy going! If you have any questions, talk to your Fairmont representative. He'll be happy to help you modernize and mechanize your maintenance operation!

Additional Ballast

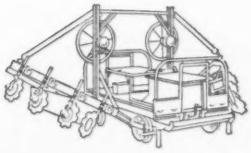
Maintenance Units



W77 SERIES A BALLAST MAINTENANCE CAR features a 112-h.p. engine with eight speeds and two-way, four-wheel drive. Attachments include scarifiers, discs, center plow, ballast equalizing box and two sizes of blades.



W92 SERIES B BALLAST BLADER AND SHAPER economically spreads and distributes ballast during surfacing and track raising. Powered by a 6-cylinder engine with a four-speed transmission. Hydraulic powered lift on plow and blades.



W62 SERIES C Ballast Discer is a self-propelled unit that improves track drainage, reshapes shoulders and aids in reballasting and tie renewal programs. Five 18" discs, full-depth operation.

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MANUFACTURERS OF BALLAST MAINTENANCE CARS, DERRICK CARS, OIL SPRAY CARS. GROUTING OUTFITS, TIE RENEWAL EQUIPMENT, RAIL RENEWAL EQUIPMENT, WEED CONTROL EQUIPMENT, HY-RAIL CARS, TRACK MOTOR CARS, PUSH CARS AND TRAILERS.

Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

MOTOR WAGON. Design features which provide production advantages for the TW-360 bottom-dump motor wagon are described in a new three-fold catalog designated MS-1269. Action photographs, catalog views and specifications help tell the TW-360 story in a concise, interesting manner. (Write: *Allis-Chalmers Manufacturing Company, Dept. RTS, Tractor Group, Milwaukee, Wis.*)

CRANE RAILS. A new brochure is available which completely describes the manufacture, drilling and punching, heat treatment, and selection of crane rails, as well as the rail clips and holders for use with them. This 24-page brochure is illustrated with photographs and line drawings, and includes dimensions of crane-rail sections in tabular form. Specifications for both the open-hearth carbon steel and the heat-treated carbon steel sections are shown. (Write: *Bethlehem Steel Company, Dept. RTS, Bethlehem, Pa.*)

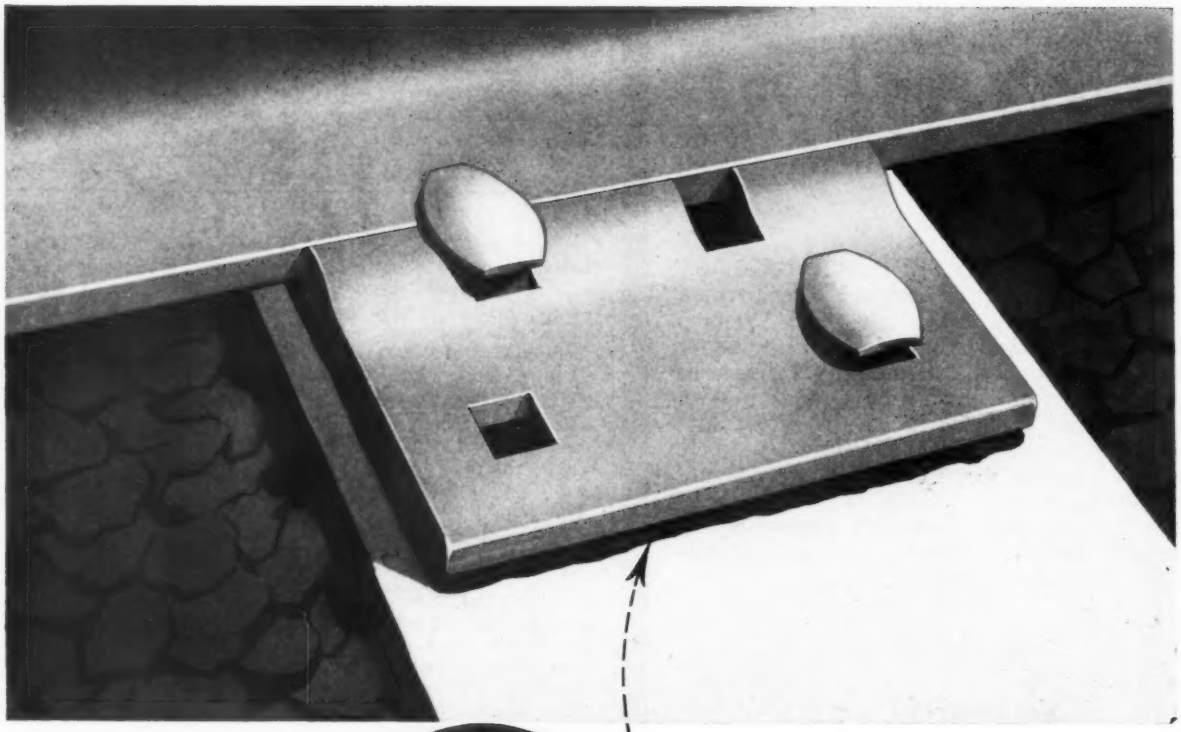
WATER CONTROL VALVES. Nine different automatic water-control valves and their uses are described in an 8-page bulletin. The line includes cushioned check valves, water-level control valves, sensitive pressure regulators, and one-man control valves. The bulletin, designated G-5A, contains several photographs of actual installations and gives interesting descriptions of the part these valves have played in the launching of guided missiles. (Write: *Golden Anderson Valve Specialty Company, Dept. RTS, 1246 Ridge Avenue, Pittsburgh 33, Pa.*)

FLAME CUTTING. A new folder, entitled "Cut Your Flame Cutting Costs," is available which describes several ways in which quality nozzle construction and proper nozzle selection can reduce gas consumption and nozzle replacement. The twelve-page folder also describes the advantages of chrome-plating and swaged construction. (Write: *Linde Company, Division of Union Carbide Corporation, Dept. RTS, 30 E. 42nd Street, New York 17, N. Y.*)

TRACK MACHINES. Three new Nordberg bulletins have been released to bring up to date literature on the Model DG heavy-duty rail grinder, the Tie Drill and the Dun-Rite Gaging Machine and Bronco. Bulletin 284 on the heavy-duty rail grinder supersedes Bulletin 203. Bulletin No. 285, describing how the tie drill now uses a centrifugal clutch which has been added to the present machines, replaces Bulletin 199. Bulletin 286, describing the Dun-Rite Gaging Machine and Bronco, replaces former Bulletin 220. (Write: *Nordberg Manufacturing Company, Dept. RTS, Milwaukee, Wis.*)

PAINT STRIPPING COMPOUNDS. Twelve different paint stripping compounds are described in a booklet, entitled "How to Strip Paint." It then discusses the Oakite Hot-Flow-On method of stripping, consisting of flowing a stripping solution through a perforated pipe rake or shower head. The second method discussed is tank immersion, in which the part to be stripped is soaked in a tank of stripping solution. Third, is the steam-gun method in which steam is combined with the stripper and flowed on the surface through a steam gun. Brushing is the fourth method, where the stripper is brushed on, allowed to soak and rinsed off. (Write: *Oakite Products, Inc., Dept. RTS, 146 Rector Street, New York 6, N. Y.*)

DROP TABLES. A 16-page booklet has recently been made available, which describes the advantages of Whiting drop tables. The booklet is fully illustrated to show pit designs and is amply supported by detailed drawings of typical installations. On-the-scene photographs of drop tables are shown to depict the various steps required for fast servicing of diesel and steam locomotives. Construction features are shown and described in detail. (Write: *Whiting Corporation, Dept. RTS, 15600 Lathrop Avenue, Harvey, Ill.*)



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When you recommend or approve an expenditure for Bird Self-Sealing Tie Pads, you can have complete confidence that it is a sound investment — guaranteeing substantial savings.

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News notes...

. . . a résumé of current events throughout the railroad world

As this issue was going to press a joint committee of the House of Representatives and the Senate was working on a compromise version of the bills, previously passed by both bodies, embodying recommendations of the Smathers' subcommittee to relieve the plight of the railroads. Whatever happens in the joint committee it is expected that the final bill will give the railroads more freedom in making competitive rates, provide for government guarantee of loans to railroads, grant the ICC power to override state commissions on matters involving abandonment of intrastate rail services, tighten the Motor Carrier Act's agricultural exemptions and sharpen the definition of private carriage. The joint committee was expected to have little difficulty reconciling differences between the two bills involving these and other provisions. Favorable House and Senate action on the compromise bill is also expected, after which it will go to the White House for President Eisenhower's signature.

•

A bleak picture for commuters in New York City was painted recently by Alfred E. Perlman, president of the New York Central. He told Mayor Robert Wagner that the road is faced with the prospect of closing Grand Central Terminal, ending commuter service and pulling out of the city. Mounting deficits on Grand Central operations are the reason. Mayor Wagner appointed a committee of city officials to meet with five NYC officers to tackle the problem. If Grand Central closed, the Central's main line operations would end at Harmon, 30 miles north of the city, and the New Haven, which also uses the terminal, would probably terminate its operations at New Rochelle, 17 miles from Grand Central.

•

A group of eastern railroads has been given permission by the ICC to raise mail rates an average of 30 per cent, effective September 1. The new rates, according to ICC estimates, will bring in revenues of $137.2 million instead of the present annual figure of $105.5 million. In addition the railroads involved will get retroactive payments of $60 million covering the two-year period in which the case was being decided.

•

Last year the railroads again proved that they are the safest form of transportation, according to the Association of American Railroads. It reported that travel by rail in 1957 was nearly twice as safe as travel by domestic air line and bus, and about 37 times as safe as travel by automobile and taxi. The compilation revealed that a passenger could have traveled 1,524 million miles last year by railroad without being involved in a fatal accident. Domestic air carriers, on the other hand, experienced one fatality for each 847 million miles; busses, one for every 730 million miles; and passenger cars, one for every 39 million miles.

News about people

ATLANTIC COAST LINE—R. B. Dulaney, general foreman in the mechanical department at Jacksonville, Fla., has been promoted to general supervisor, roadway machinery, reporting directly to the general superintendent motive power and equipment at Wilmington, N. C.

BESSEMER & LAKE ERIE—D. T. Faries, principal assistant engineer, has been promoted to chief engineer, with headquarters as before at Greenville, Pa., succeeding **J. E. Yewell,** retired.

CANADIAN NATIONAL—D. H. Eckford, division engineer at Victoria, B. C., has been appointed transportation engineer with the same headquarters. **H. C. Lear,** assistant engineer on the CNR's subsidiary line, the Duluth, Winnipeg & Pacific, at West Duluth, Minn., has been promoted to division engineer.

CHESAPEAKE & OHIO—T. L. Biggar has been appointed general supervisor of track with headquarters at Richmond, Va., and **F. E. Huddleston, Jr.,** has been appointed general supervisor of track with headquarters at Huntington, W. Va.

FRISCO—W. F. Lawson has been appointed superintendent roadway shops, with headquarters at Springfield, Mo., and **C. W. Denham** has been appointed general foreman, roadway shops, with headquarters also at Springfield.

MISSOURI PACIFIC—Charles E. Cherry, division engineer at Nevada, Mo., has retired after 52 years of service with this company. **Harrison M. Bryant,** bridge and building supervisor at Coffeyville, Kans., has retired after 50 years of service with the company.

NEW YORK CENTRAL—A. Matthews, Jr., has been appointed assistant district engineer of the Western District, with headquarters at Cleveland, Ohio, succeeding **R. F. Lawson,** who has been promoted to district engineer with the same headquarters, succeeding **L. Bristow,** transferred.

Eugene J. Huelsman, assistant engineer at Chicago, has been promoted to engineer maintenance of way at Pittsburgh, Pa. **William A. Marx,** bridge inspector at Jackson, Mich., has been promoted to office engineer in the bridges and buildings department, at the same point. **Anthony J. Vigneault,** assistant engineer in maintenance of way department at Springfield, Mass., has been appointed office engineer on the Boston & Albany division.

SOUTHERN—Jack E. Greene has been appointed assistant division engineer of this company's subsidiary, the New Orleans & Northeastern, with jurisdiction over the New Orleans Terminal Company, with headquarters at Hattiesburg, Miss. He succeeds **Herbert D. Minnis, Jr.,** promoted. **Ross D. Rothell,** bridge and building supervisor at Princeton, Ind., has been transferred to Lexington, Ky. **William G. Park** has been appointed bridge and building supervisor at Princeton to replace Mr. Rothell.

O. L. Lunsford, Jr., assistant track supervisor at Rockmart, Ga., has been promoted to track supervisor at Jesup, Ga.

UNION PACIFIC—L. P. Drew, assistant chief engineer, with headquarters at Omaha, Neb., retired on June 30. **LeRoy G. Wade,** general supervisor of work equipment, at Omaha, Neb., retired June 30 after a half century of railroad service.

Biographical briefs

Norman M. Cary, who has been appointed general division engineer on the Southern at Atlanta, Ga. (*RT&S*, June, p. 10), was born at Richmond, Va. and began his service with the Southern as a bridge and building apprentice in June 1939. After serving as B&B helper, rodman and student apprentice, he was advanced to assistant supervisor in June 1944. He entered military service in July 1944, returning to the Southern in November 1946. After serving as track supervisor at Greenwood, S. C., and Columbia, he was appointed bridge and building supervisor at Greensboro, N. C., in February 1951. In November 1955, he was promoted to division engineer at Bristol, Va., and in June 1956 he was transferred to Valdosta, Ga., where he was located at the time of his recent appointment as general division engineer.

Frederick G. Keller, Jr., who has been appointed track supervisor on the Southern at Orangeburg, S. C. (*RT&S*, July, p. 10), was born at Lynchburg, Va. He began his railway service with the Southern in January 1956 as a student apprentice. In July of the same year, he became an assistant supervisor, which position he held until his recent promotion.

O. L. Lunsford, Jr., who has been appointed track supervisor on the Southern at Jesup, Ga. (announced elsewhere in this issue), was born at Asheville, N. C. He entered the service of the Southern in June 1942 as a section laborer at Inman, S. C. In June 1943 he was made a welder helper at Hendersonville, N. C., and later served in the same capacity at Asheville. In September 1954, he was promoted to assistant track supervisor at Rockmart, Ga., which position he was holding at the time of his promotion.

J. William McPherson, who has been appointed division engineer on the Southern at Selma, Ala., (*RT&S*, June, p. 10), entered the service of the Southern in June 1937 as a section laborer. In December 1939 he became an apprentice foreman, and from December 1940 until September 1943, he served as rodman, relief section foreman, blueprinter, transitman, and student apprentice. At the end of this period he was advanced to assistant track supervisor at Danville, Va., and in July 1944 he was further promoted to track supervisor at South Clarksville, Va. Later he served in that capacity at Keysville, Va., and Charlottesville. In November 1955 he was named assistant division engineer at Greenville, S. C., which position he was holding at the time of his recent promotion to division engineer.

Dennis N. Schrumm, who has been appointed division engineer on the Southern at Charleston, S. C. (*RT&S*, June, p. 10), was born in Lincoln county, N. C. He entered the service of the Southern as a bridge and building apprentice at Greenville, S. C., in November 1917. After serving as carpenter and assistant foreman he was advanced to foreman at Greenville in January 1920. He was promoted to assistant bridge and building supervisor at Charlotte, N. C., in July 1951, and in January 1954 he was further advanced to bridge and building supervisor at Charleston, where he was located at the time of his recent promotion.

Clyde A. Stephenson, who has been appointed general division engineer on the Southern at Birmingham, Ala. (*RT&S*, June, p. 10), is a native of Centerville, Tenn. Mr. Stephenson entered the service of the Southern in May 1946 as assistant supervisor in the office of the chief engineer, maintenance of way and structures, Western Lines. In April 1947 he was promoted to track supervisor at Ludlow, Ky., becoming assistant division engineer at Louisville, Ky., in December 1950. In May 1954 he was promoted to division engineer at Hattiesburg, Miss., which position he was holding at the time of his recent appointment as general division engineer at Birmingham.

Stanley W. Sweet, 34, who was recently appointed roadmaster on the Bessemer & Lake Erie at Greenville, Pa. (*RT&S*, May, p. 10), graduated from Tri-State College in 1947 with a B.S. degree in civil engineering and entered railroad service in November 1947 as a rodman-draftsman with the Chesapeake & Ohio at Columbus, Ohio. In March 1948 he entered the service of the Wabash as assistant engineer, serving on the Montpelier and Moberly divisions. He joined the B&LE in January 1950 as assistant supervisor track, being appointed acting field engineer in January 1954. In April 1956 he was promoted to supervisor track—the position he held at the time of his recent promotion.

LeRoy G. Wade who has retired as general supervisor of work equipment of the

(*Continued on page* 52)

LOOK . . . AT THIS EASIER, THRIFTIER WAY TO STOP WEEDS

COMPARE THE RATE—Enough UREABOR weed killer to treat 12 square feet is held in this hand! Consider the convenience and economy afforded by a rate of application as low as 1 lb. per 100 square feet of area.

COMPARE THE EASE—Applying UREABOR weed killer is as easy as walking! By actual test, one man spreading this granular material *dry* with the PCB Spreader can cover a given area in less time than can a two-man spray crew.

COMPARE THE RESULTS—The killing effect of UREABOR continues throughout a season or more! A single application can mean a weed-free surface. Roads from coast to coast are using UREABOR to get the lasting control it provides.

COMPARE THE COSTS—UREABOR kills weeds for pennies; saves you dollars! It is low priced . . . your initial outlay is small. Further economy comes from low rates of application, savings of man-hours, and convenience in handling and storage.

COMPARE . . . 20 MULE TEAM UREABOR® WEED and GRASS KILLER

The PCB Spreader applies Ureabor quickly and uniformly at low rates. It holds enough Ureabor to treat up to 2500 sq. ft. without refilling. Available for $10.75 delivered —anywhere in U.S.A.

UREABOR invites comparison with all other weed killers from any standpoint. What is your gauge of measurement? Is it EFFECTIVENESS? . . . SAFETY? UREABOR is effective and safe in every respect. It is *nonflammable, noncorrosive* to ferrous metals, *nonpoisonous* when used as directed. No product is easier to apply . . . there is nothing to mix; no water to haul. Check all the advantages of UREABOR and you'll agree that it stands alone. Write for literature.

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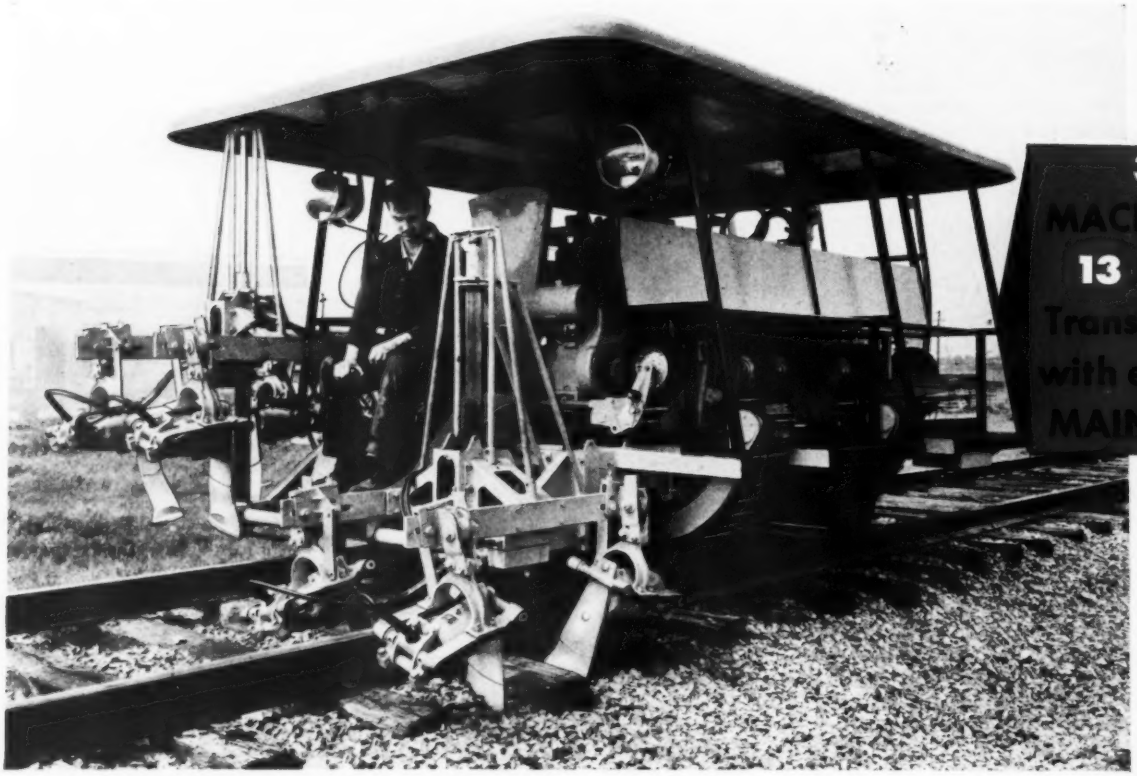
NEW CONCEPT IN TRACK

Tamper MULTI-GANG* PACKAGE UNIT

Greatly Lowers Maintenance Costs



A COMPLETE UNIT—all three machines (or other equipment) are housed in Main Car.

RAPIDLY REMOVED FROM TRACK by Crawler Set-Off . . . in a matter of seconds.

POWER DOWNFEED OF INDEPENDENT WORKHEADS . . . operates easily.

HYDRAULIC PROPULSION . . . the Main Car travels up to 25 MPH.

THESE HYDRAULIC MACHINES are *easily* loaded on or unloaded from Main Car, by hydraulic Tail Rack.

LOOK WHAT THE MULTI-GANG WILL DO:

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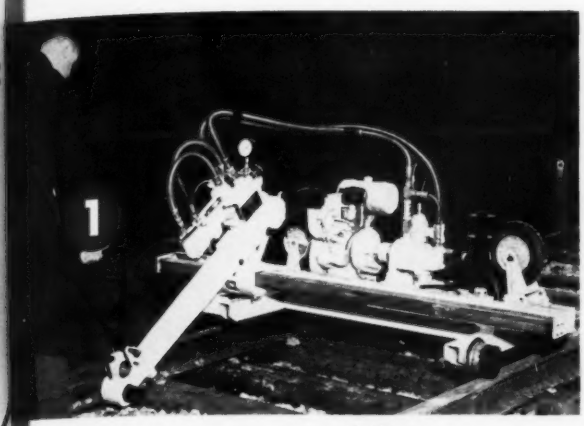
MULTI-GANG'S Main Car is 171″ long x 113″ wide x 84″ high.

TAMPER MULTI-GANG PACKAGE UNIT

consists of:
Main Car with Power Downfeed Tampers and Crawler Set-Off
Hydrillbolter
Spike Hydrejector—Tie Hydrenewer
Comboliner

MULTI-GANG UNIT EXTENDS THE TRACK SECTION

SECTION MAINTENANCE



HYDRILLBOLTER* (*Model* BD)

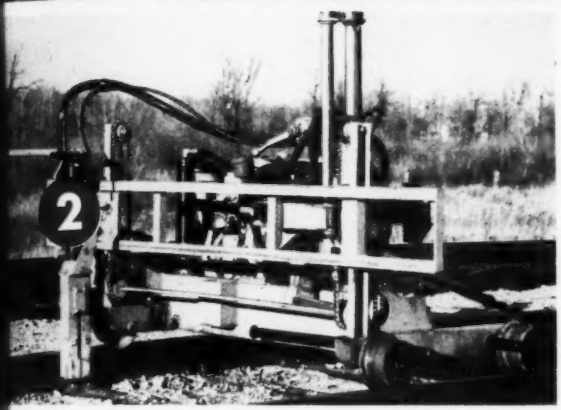
Combination Bolter and Rail Drill

Hydraulic Transmission
Minimum Mechanical Replacement Parts

BOLTER
- single control lever, manned by one operator
- automatic change from high speed, low torque, for 'running up' nuts to low speed, high torque for nut tightening
- handles nuts on either side of both rails

DRILL
- drill attachment adapted in less than 2 min.
- manned by one operator
- easily adjusted for different rail sizes
- drill bits quickly interchanged

HYDRILLBOLTER can be removed from track by two men.



SPIKE HYDREJECTOR*

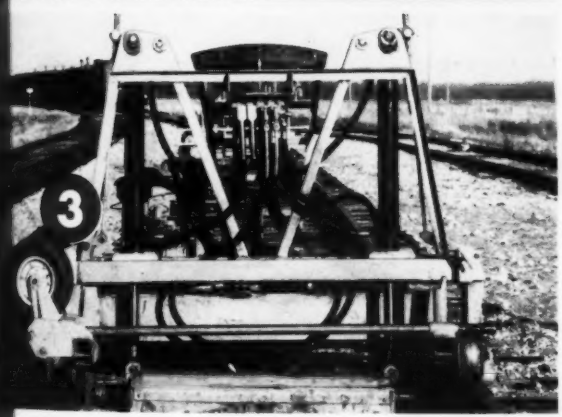
TIE HYDRENEWER* (*Model* PR)

Combination Spike Puller and Tie Renewer

Lightweight • completely hydraulic • easily operated by one man • pulls spikes with bending.

Tie Renewer is adapted to Spike Puller in seconds
No disturbance of track line or surface
Renews without digging out tie ends

Removed from track by one man.



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- simply insert lining anchors and slide out wheels to line the track
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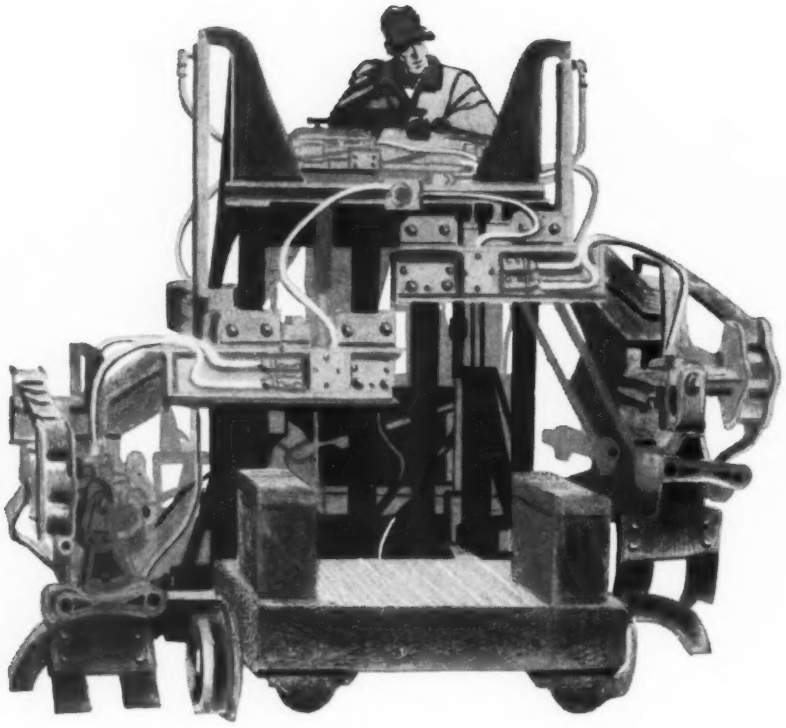

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RAILROAD PRODUCTS

Dear reader:

RAILWAY
TRACK and STRUCTURES

This question of standardization

It's always easy to get an argument started on the subject of standardization. In fact, it might be said that there is a continual argument in progress between the proponents of standardization and those who favor a "go slow" policy.

There are times when the argument fades into the background. There are others when it flares up to the point where it becomes a matter of general interest. We are in one of the latter periods right now.

A factor in causing the present flare-up is a report presented at the recent convention of the AAR's Purchases and Stores Division by its Committee on Simplification and Standardization. A section of the report deals with the standardization of rail sections. It points out that there are at least 43 rail sections available to the railroads of North America. The report concludes with the recommendation that "serious consideration be given to the feasibility of reducing the number of rail sections presently rolled and that at the same time an effort be made toward the adoption of universal drilling standards."

About the time this report was being presented this magazine received a letter from W. E. Gardner, principal assistant engineer of the Wabash, advocating a higher degree of standardization of switches and frogs. Mr. Gardner's letter, together with expressions of opinion from manufacturers and railroad maintenance officers, is published on pages 30 and 31 of this issue.

Hardly anyone will disagree with the statement that some standardization is desirable in the railroad maintenance of way field. The argument is not whether there should be standardization, but how far it should be carried. This question presents the railroads with one of the most difficult and complex propositions they have ever faced. It is made so by the fact that there are two conflicting elements present which apparently can never be fully reconciled. These are:

(1) Standardization implies a fixing or "freezing" of designs, whereas
(2) A willingness or ability to change designs is necessary in the interest of progress.

Superficially it might appear to be easy to reconcile these points simply by changing standards as required to keep pace with progress. In practice, however, it doesn't always work out this way. Standards are like habits; they're not easy to change. For instance, there was the recent case of a transportation system whose M/W department was found to be using standards developed in the early Twenties. In this case, and others like it, the purpose of standardization—to reduce costs—is defeated when the standards are continued in use after better and more economical designs or practices have been developed.

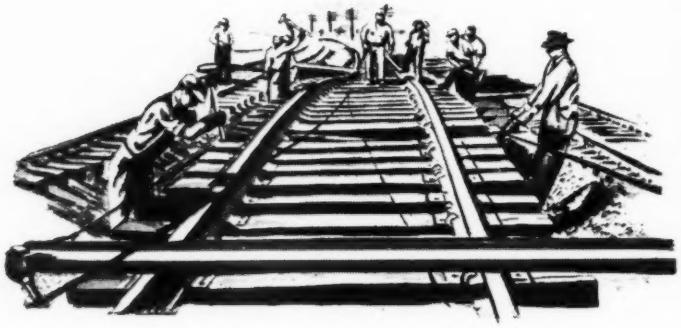
Railroads want and need the advantages of standardization. They also want and need the benefits of technological progress. They can have both, within limits, if their thinking regarding standardization is characterized by flexibility rather than rigidity.

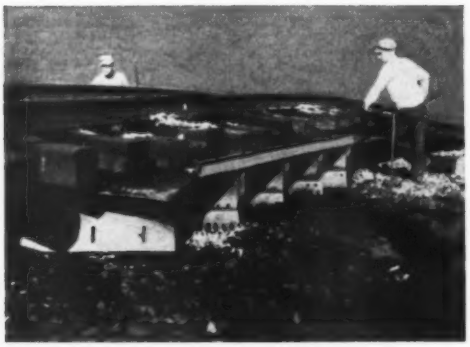
MHD

WORN TIES REMOVED

IN SECONDS . . .

. . . as you plow out ballast the proven MANNIX way!





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How Armco Steel Buildings meet the Maine Central's need for low-cost, efficient facilities

This 40′ x 120′ Armco Building with 10′ x 120′ lean-to is used by the Maine Central as a mail sorting building at Portland, Maine.

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Pre-engineered Armco Steel Buildings save weeks, even months in construction time and labor costs.

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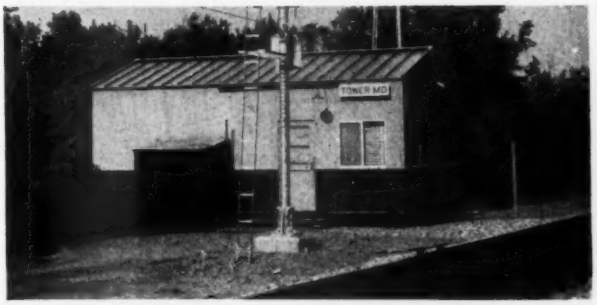
All-steel construction means there is nothing to crack, warp or rot. And steel is noncombustible.

DESIGNED FOR THE FUTURE

Armco Buildings can be easily extended, rearranged or even moved to another location without loss of material.

The use of Armco Steel Buildings by the Maine Central Railroad is typical of more than 100 American railroads. These factory-engineered steel structures provide the ideal solution to almost any building problem.

Armco Drainage & Metal Products, Inc., 3168 Curtis St., Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



Here's a 16′ x 26′ Main Central traffic control building at Hermon, Maine. Buildings like this can go up in hours.

A 20′ x 64′ Armco Building with lean-to is used for Main Central engine house at Calais, Maine.

Our free catalog describing Armco Steel Buildings will give you plenty of money-saving ideas for your railroad. Write for it today, or just mail the coupon.

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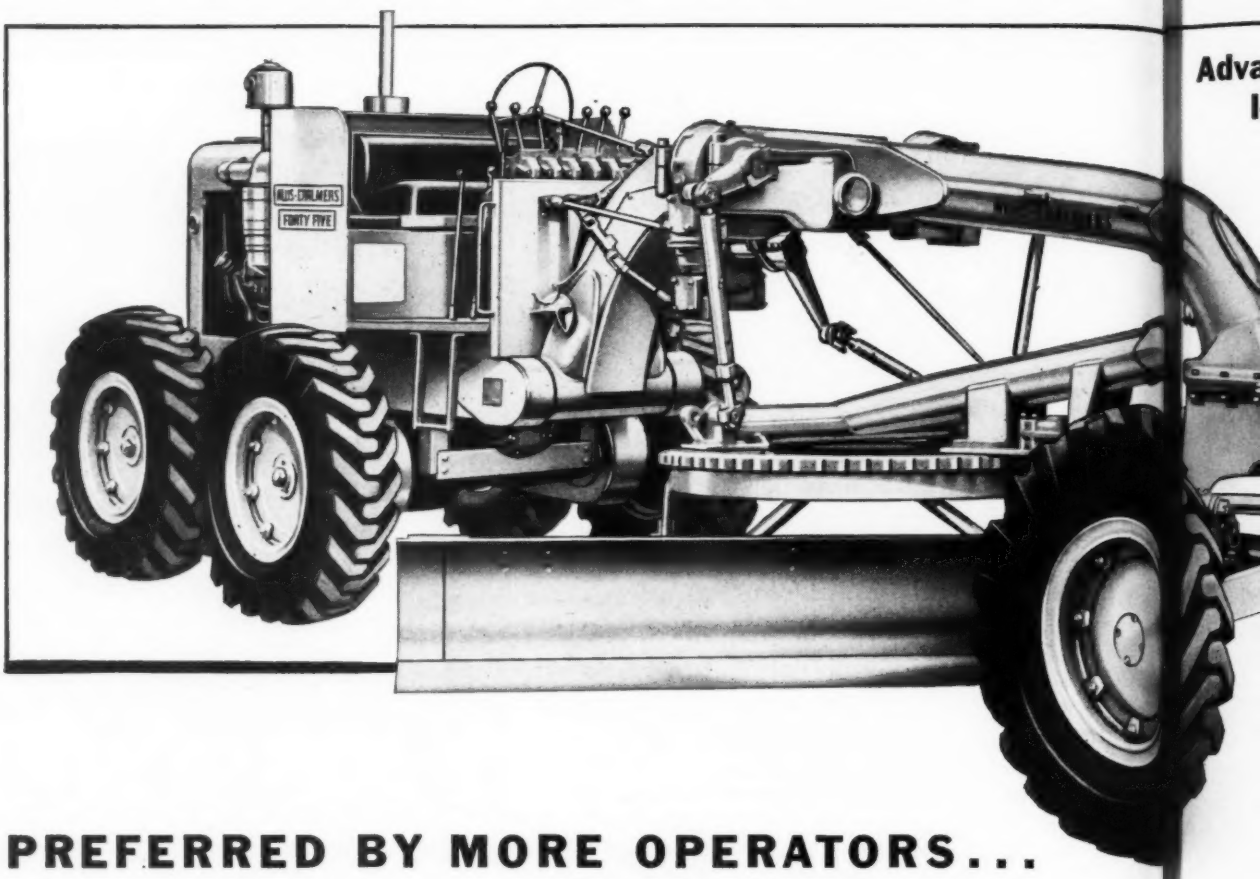

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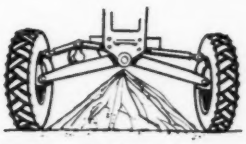
Advantages that mean more production . . . less maintenance . . . easier and better operation



Extra high axle and throat clearance means bigger loads at the blade.

The ROLL-AWAY moldboard rolls dirt, gives more performance per horsepower, more production per gallon.

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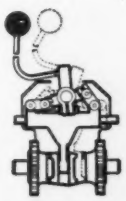
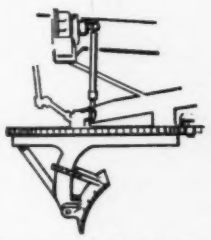
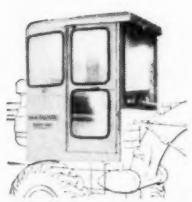


Toggle-type controls are exclusive with Allis-Chalmers.

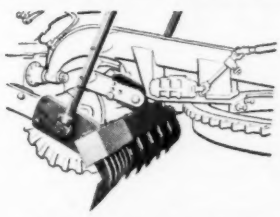


Front-mounted lift cases eliminate long shafts that twist under loads.

Matched attachments and accessories make it a year-round producer

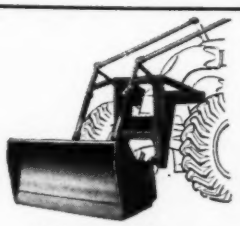


All-steel, stand-up cab

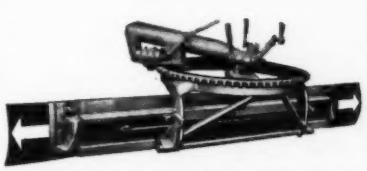


11-tooth, V-type scarifier

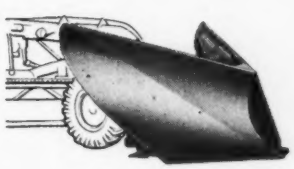
Hancock elevator



8-foot bulldozer

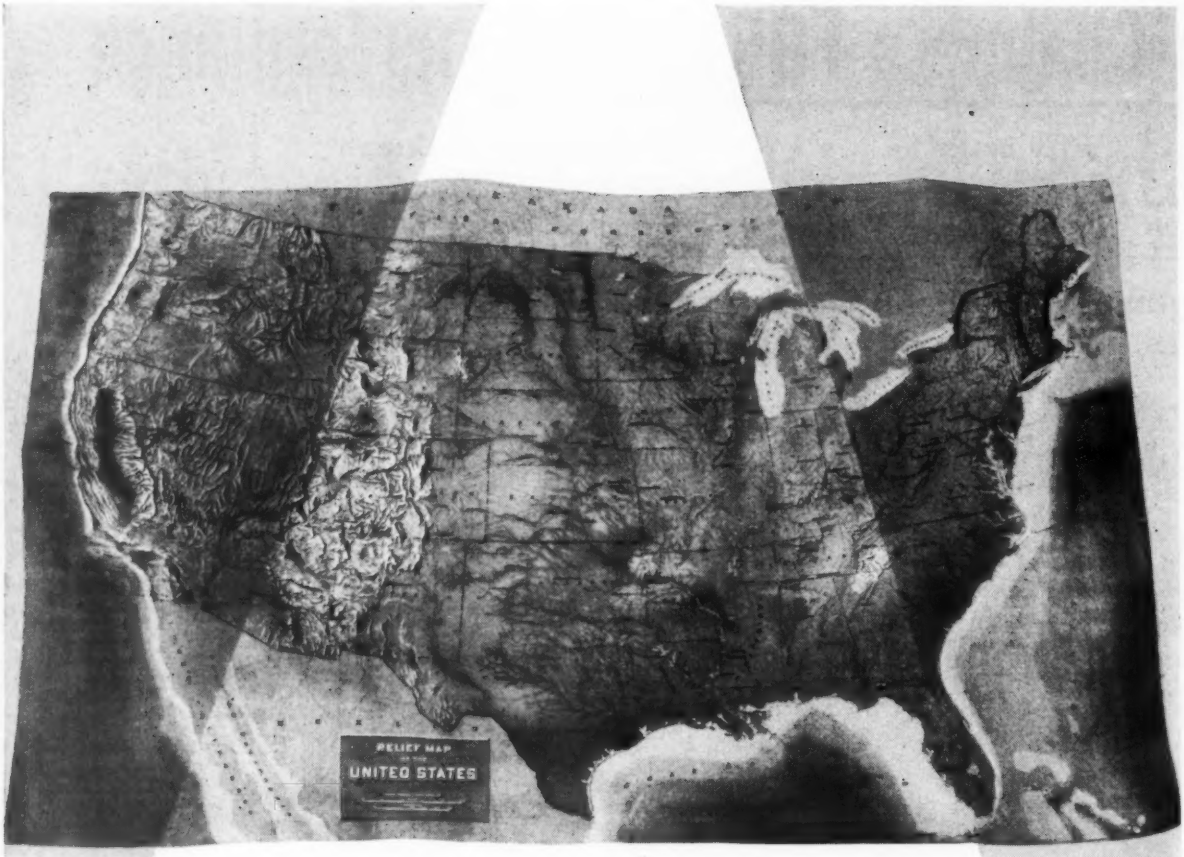


Hydraulic, shiftable moldboard



V-type snowplow

ROLL-AWAY is an Allis-Chalmers trademark.



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You may be clearing brush for rights-of-way from the Gulf of Mexico to the Canadian border; you may be a highway commissioner faced with equally important problems of brush and weed control from Virginia to Oregon.

In any case, your Diamond agricultural chemicals specialist will study your situation and recommend the *one* brush and weed control formulation best suited to your specific needs.

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RAILWAY TRACK and STRUCTURES

Slide plates used under long truss spans

After many years of service, it can be expected that the rollers under the expansion ends of trusses will have flat spots worn in them. When this condition progresses to the point where free movement of the spans under expansion and contraction is restricted, locking stresses to the extent that cracks appear in the lower chords, the bearings should be replaced. This is what happened to a bridge on the Illinois Central. However, instead of replacing the rollers in kind, the road chose to use special slide plates under the bearings at the expansion ends.

• The use of slide plates at the expansion ends of steel bridges is not unusual. But their installation under steel spans more than 70 ft long is distinctly so. That's what the Illinois Central is doing on a bridge project it has underway near LaSalle, Ill. The slide plates, however, are not of the conventional type but are graphite impregnated bronze-alloy plates called Lubrite Expansion Plates. The IC is installing them at the expansion ends of trusses approximately 160 ft long. Each plate carries approximately 102,500 lb dead load and about 325,000 lb live load.

The bridge is No. A-855-5 over the Illinois river, and it includes a 340-ft riveted through truss, 15 pin-connected deck trusses and 3 deck plate-girder spans. The through truss was installed in 1934 and, being in good condition, is not involved in the work now being done.

The original provision for expansion for the other spans consisted of nests of seven rollers, 3⅝ in. in diameter. These have been in service for 62 years, during which time they have become badly worn. Also, engine cinders, wind-blown dirt and cement dust have packed in around the rollers, interfering with their free movement, with the result that flat spots have been ground into them.

Cracks appear in chords

Because the free movement of the span was being prevented by the condition of the expansion rollers, stresses of unknown magnitude were being induced in the bottom chords with consequent overstressing. This was the probable cause of the occurrence of cracks in the angles of the bottom chords near the L-0 and L-7 points.

An inspection of the general condition of this bridge was made by the

Features of the Lubrite slide plates . . .

Lubrite Expansion Plates usually are made from various sand-cast bronze alloys. Their sliding surface is machined and trepanned with special recesses. These are filled with a special graphite lubricant that provides a low coefficient of friction. The lubricant is compressed into the recesses, at pressures of about 18,000 to 20,000 psi, where it forms a dense, solid, continuous supply of lubricant.

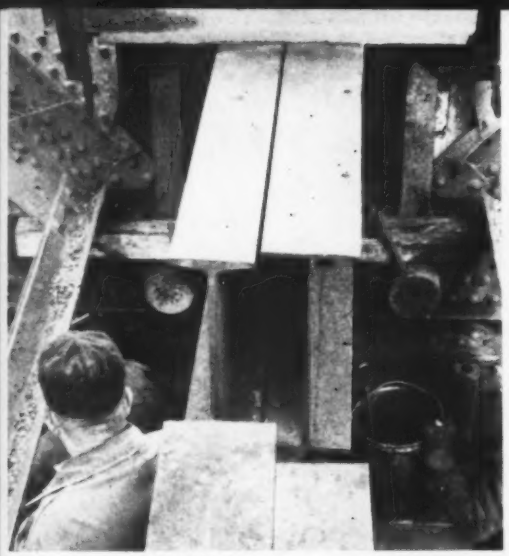
The theory behind this form of lubrication is that it does not permit metal-to-metal contact. The sliding plate is said to be riding on a film of lubricant, capable of carrying heavy loads without breaking down. The lubricant formula is altered by the manufacturer to suit various load, temperature and application requirements.

The Lubrite plate is said to be resistant to corrosion by moisture, water, oxygen of the air and other material elements. For a bridge bearing only one Lubrite plate is required. Usually, it is secured to the base or masonry plate either with weldments or pressed into a machined recess of the base plate, but other methods of fastening have also proved satisfactory. The manufacturer states that it is not necessary to provide a ground or polished surface to the sole plate engaging the Lubrite plate. Only a normal machined finish is required.

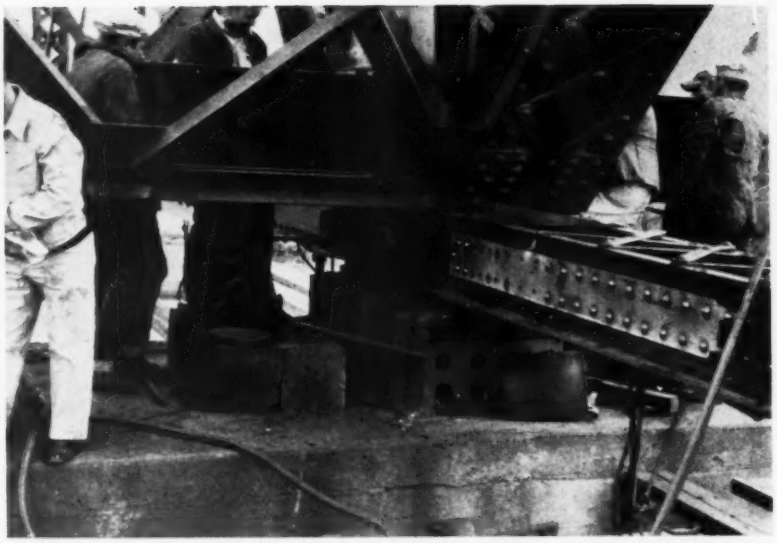
LUBRITE expansion plates will sustain loads ranging from 500 to 1,200 psi.

Loadings for the standard Lubrite bronze plates range from 500 to 1,200 psi. Where higher unit loadings are required, the Hi-Tin and the Rolled Bronze Alloy bearings are recommended up to 2,500 psi and the Bridge Bronze bearing for loadings up to 3,500 psi.

. . . and how they are installed



JACKING arrangement permits adjacent ends of two spans to be raised together.



CHORD PLATES were partially riveted to the outer surfaces of the web plates between the L-0 and L-2 points. Riveting was completed after chord had been tightened.

This is how the plates are inserted

consulting firm of Modjeski & Masters. It was found that the upper shoe and lower shoe casting at the expansion ends were in good condition, with only slight corrugations in their surfaces. It was decided that these could be reused and any that were out of level would be brought up to grade. It was also decided to replace the worn rollers with upper and lower bearing plates with a Lubrite type plate between them, whose combined thicknesses would equal the 3⅝-in diameter of the original rollers.

It was further decided to repair the end panels of the bottom truss chords. Plans were made to hook a loop bar around each pin at the L-0 and L-2 points and the L-5 and L-7 points. These would be anchored to new diaphrams placed within the chords. Then 8½-in by ½-in plates were to be riveted to the outer surfaces of the two existing web plates.

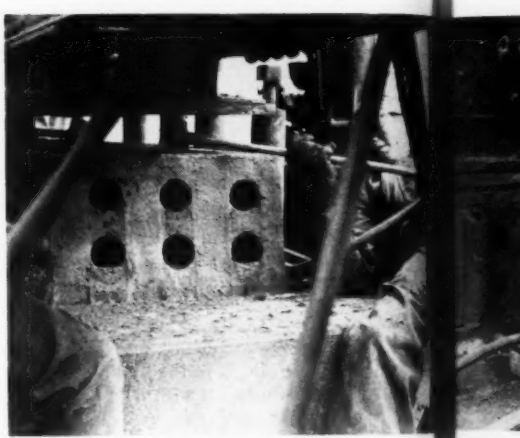
Work was begun on this project in October 1957 by one of the railroad's system bridge gangs, and the work is still under way. Equipment being used includes four 75-ton Duff-Norton roller-bearing mechanical jacks, a Worthington Blue Brute 210-cfm compressor, a Fairmont W-64 derrick car, and riveting and welding equipment.

Work is being progressed from the north to the south end of the bridge. The prefabricated chord plates, 42 ft 1 in long, are lowered from the deck and temporarily fastened to the lower chord. Scaffolding is then built under each chord, extending from the pier to slightly beyond the L-2 or L-5 points. The chord plates then are riveted to the outside webs of the lower chord, except near their ends. The rivets at the ends are temporarily left out so that the prefabricated diaphrams can be inserted between the chord members and the chords tightened after the replacement of the bearings. Also, two of the top lacing bars and a few rivets of the top angles are removed to permit insertion of the diaphrams. These also are connected later.

The next step is the construction of the jacking arrangement to lift the spans so that the bearing plates and slide plate can be inserted. The adjacent ends of two spans are raised simultaneously. This is done by removing the pin nuts and substituting pin extensions, looping the end of an eye-bar over each extension, bolting the other ends of the eye-bars to lifting beams, and inserting jacking beams beneath them. The spans are then jacked up about ½ in and the old roller nests are pried out.

Shoes carefully cleaned

Care is exercised to get the surfaces of the upper and lower castings clean. The dirt between the surfaces is first blown out with compressed air. Then scaling tools are used to loosen all accumulated rust. The handles of the scaling tools being used have been extended with lengths of pipe. This

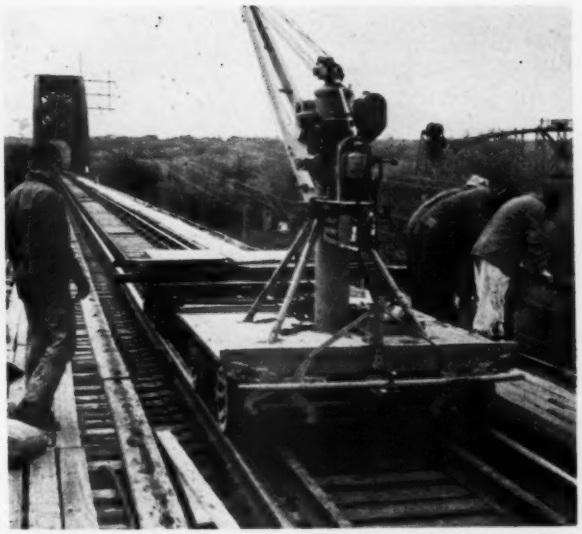


SCALING tools were used to loosen all accumulated rust between the castings.

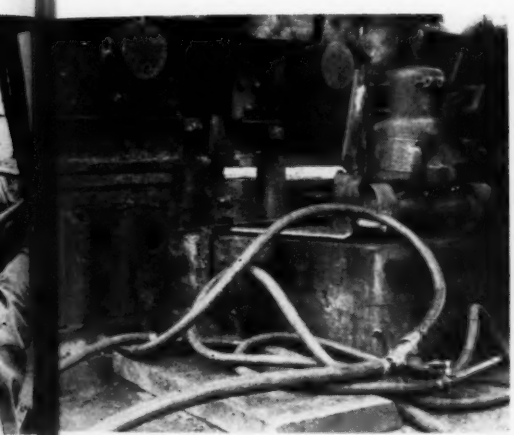
was done so that at no time is it necessary for the operators to place their hands or arms between the upper and lower castings. When the scaling work is completed, the area is again blown clean of debris, resulting in bright clean metal.

To insure uniform bearing, the undulations in the surface of the lower casting are filled with a thin layer of Embeco. Then the lower bearing plate, which includes the Lubrite plate, is slid into the opening, followed by the upper bearing plate. The lower bearing plate has a groove on its lower surface for engaging a longitudinal rib on the casting. This insures proper placement and prevents lateral movement. The upper bearing plate also has a similar groove on its upper surface for engaging a rib on

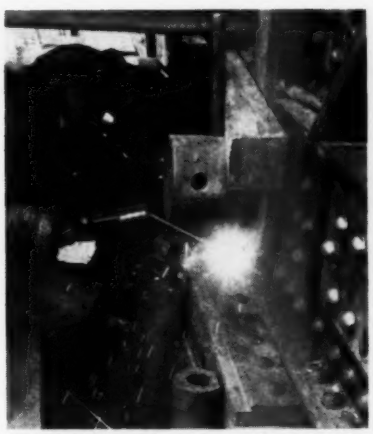
ROLLER NESTS were packed with dirt and cement dust. After the spans were raised about ½ in, the rollers were removed.



DERRICK CAR with power lift was used to lower heavy parts from the deck to tops of piers. Push car carries new slide plates.



EMBECO was spread on the lower casting before the slide plates were inserted.



ADJACENT lower bearing plates on double-shoe castings were welded together.

STOPS keep lower plates from working loose. Upper plates welded to top shoe.

the upper shoe. The Lubrite plate is recessed into the surface of the bottom bearing plate.

Plates firmly secured

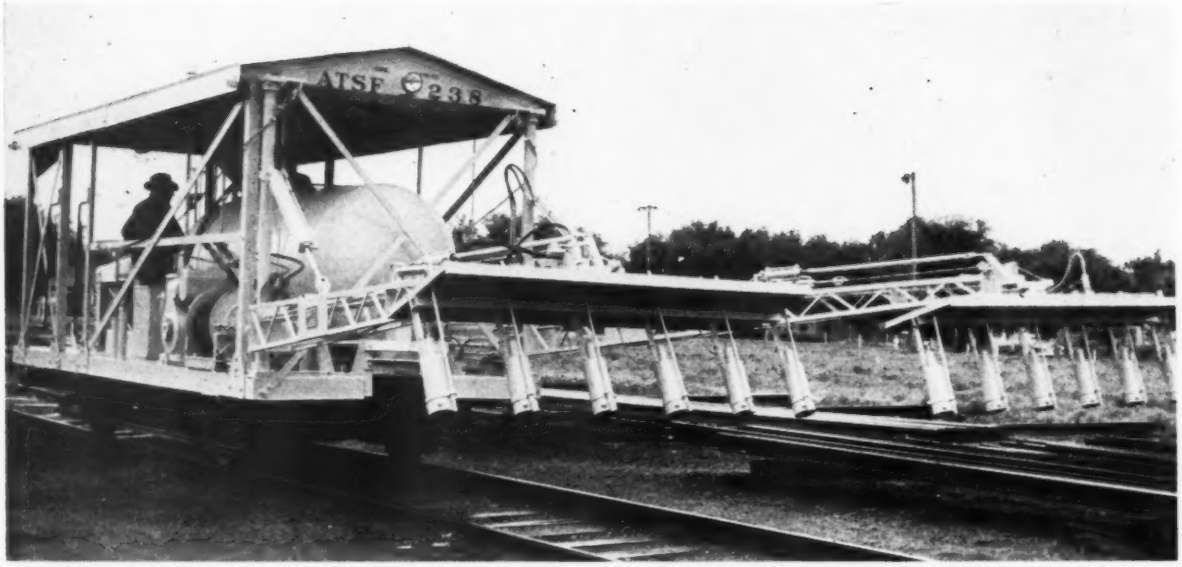
The lower plates are prevented from working out longitudinally by the provision of stops at the plate ends which hook over the ends of the castings. On single-shoe castings, the plates have stops at both ends. On double-shoe castings, these plates have stops only at their outside ends. The inside ends are chamferred on their upper surfaces and, when the adjacent plates are in place touching one another, a V-groove is formed. A weld bead is then laid in this groove to hold the plates together.

The upper bearing plates are field welded to the top shoe to keep them in proper position. They are prevented from moving laterally off the lower plates by anchor-bolt sleeves cast integrally with the lower castings and which project above them to the top of the bottom plate of the upper shoe. The welding is done after the jacks have lowered the spans.

After the slide plates have been installed, the next step is the leveling of the lower castings on the piers. Top-of-rail profile, taken by the engineering department, determines the amount of change. The nuts of the anchor bolts are loosened, the lower castings are chained to the lifting beams of the jacking setup, and the adjacent spans are raised again to the desired level. Embeco grout is then applied beneath the lower castings.

The final step in this procedure is the tying of the new chord bars to the new diaphrams in the lower chords. The diaphrams are riveted to the ends of the loop bars around the pins at the L-0 and L-2 pin points, and a six-part block-and-tackle line is attached to the diaphrams. A tension gage is used to obtain an initial stress of about 24,000 lb. Holes are then drilled through the chord webs and diaphrams and the members are tied together by rivets. The same procedure is then started at the next pier.

E. A. Johnson, engineer of bridges, Illinois Central, under whose direction this work is being carried out, states that the work is scheduled for completion by October 1, 1958. It is expected that the plates will endure for the lifetime of the structure.



BURNING SPEED of the LPG weed burner ranges up to 10 mph. Cost of fuel and labor last year averaged $7.46 per mile.

New machine on Santa Fe . . .

For several years the Santa Fe has been experimenting with liquified petroleum gas as a weed-burning fuel. Out of these tests has come a weed burner, designed especially to handle the high-pressure fuel, which the road reports is performing successfully in regular service.

. . . Burn wee

• A new weed burner in use on the Santa Fe spurts flames 6 to 12 ft long with a temperature of 2500 deg F. It's the first machine to be built for railroad service that is designed to use liquified petroleum gas as fuel.

The road's maintenance officers say the LPG burner does a complete job of destroying vegetation, regardless of how green it may be, and leaves no residue. They also say it is economical to operate and that, because of high burning speeds (up to 10 mph), it keeps the fire hazard at a minimum. The machine is designed to burn either propane or butane, although propane has been used exclusively so far. It is used largely for burning weeds on yard tracks and branch lines.

The Santa Fe has been experimenting with liquified petroleum gas as a weed-burning fuel for a number of years. The problems to be overcome stemmed largely from the fact that a machine had to be designed for a fuel that must be stored and used under considerable pressure. Also the high flame temperature and the attendant high burning speeds introduced another problem. This was the need for providing means for quickly adjusting the position of the burner heads. Hence, the use of hydraulic controls was indicated.

During the tests several pilot models were tried out. Based on experience with these earlier models, a machine has now been developed that is giving satisfactory results in regular service. The intention is to build additional machines of this type as conditions permit.

The LPG weed burner, designated Santa Fe weed burner No. 238, is actually a converted unit. Basis of the machine is a Fairmont M-57 dis-

tillate burner. The chassis, canopy, running gear and brake system were reused; everything else was removed. A new supply tank, propelling engine and transmission were installed by the Santa Fe's own forces at its M/W shop at Albuquerque, N. M. For the burners, booms and hydraulic controls and related equipment, the road engaged the services of the Agricultural Equipment Corporation, La Junta, Colo. This company was familiar with the problems involved because it had been manufacturing LPG burners for agricultural use for some time.

The machine has 12 burner heads divided equally between two manifolds. Each manifold covers a width of 8 ft and weighs about 400 lbs. They are each mounted at the end of a 14-ft boom made of Corten steel angles. By means of hydraulic controls the booms may be rotated through an angle of 180 deg in the horizontal plane and 60 deg vertically. This feature, combined with similar hydraulic controls for the manifolds, makes it possible to burn weeds to a distance of 24 ft each way from the center line.

Tank designed for 350 psi

The machine carries a single storage tank with a capacity of 1000 gal. Experience has shown that this capacity is not sufficient once in awhile for a full day's operation without refueling. Hence, subsequent burners will probably be provided with two tanks with a combined capacity somewhat greater than 1000 gal. To meet code requirements it was necessary to design the tank for a pressure of 350 psi.

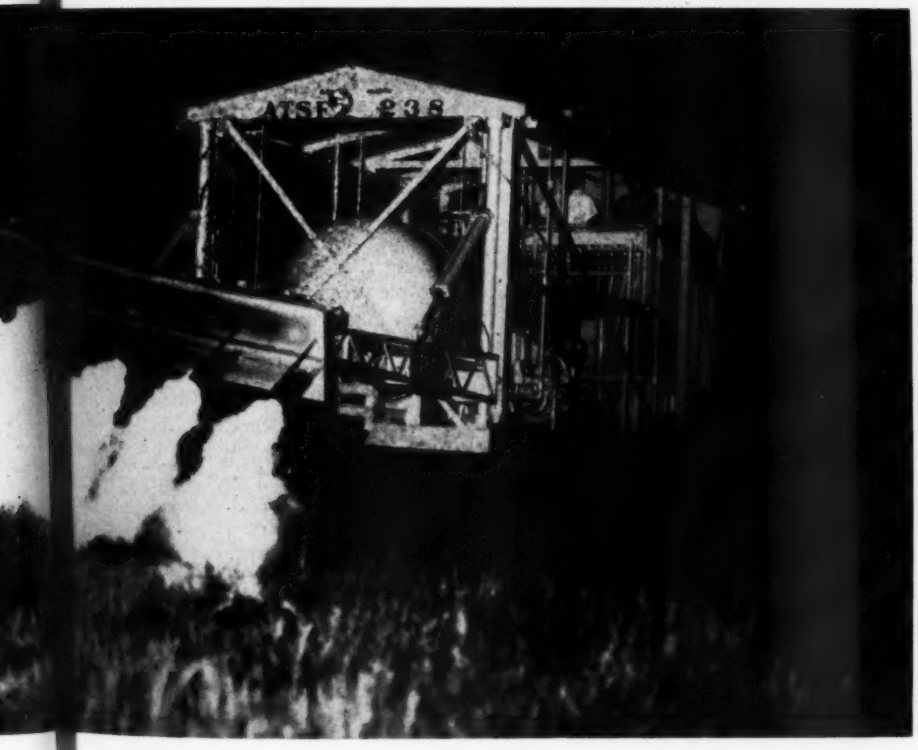
The same fuel used for burning weeds is also used for operating the propelling engine which consists of an International Red Diamond 6-cylinder, 126-hp unit operating at 2,800 rpm. Travel speeds up to 30 mph in either direction may be attained. The propelling engine also operates the hydraulic pump for the boom and manifold controls. This is a model KJ Gresen pump with a capacity of 12 gpm at 400 rpm. Experience with the burner has indicated the need for a separate engine for operating the hydraulic pump.

The new machine may be fueled directly from a tank car, but there are drawbacks to this practice. "If refueling is necessary during the day we lose productive time if we have to move the burner to the site of the tank car for refueling," explains R. H. Beeder, the Santa Fe's assistant chief engineer system. "It costs more per gallon to buy the fuel from local dealers then if we get it in tank-car lots, but it's more economical in the long run.

"If we know that refueling is going to be necessary during the day we make arrangements with a local dealer to have a tank truck meet the burner at a certain time and place. That way the time lost is held to a minimum. When tying up at the end of the day it's also a simple matter to call up a dealer and arrange for refueling the burner in preparation for the next day's work."

The seasonal factor is a consideration in adding to the economy of burning weeds with the LPG machine, Mr. Beeder explained. "This work is going on," he said, "at a time when sales of propane for heating are slow. Consequently, the price is more favorable than at other times."

ADJUSTABLE FEATURES of manifolds are illustrated by this unusual nighttime view of the burner in operation. The machine is not normally operated at night.



...rn weeds with propane

Here's what it costs

What about the cost of burning weeds by this method? In 1957, the burner was operated over about 600 miles of line on the Western division of the road's Western Lines. This was an average of about 25 miles per day of operation. The fuel consumption averaged 48.7 gal per mile, and the average cost per gallon was 8.58 cents. This gives a cost per mile for fuel of $4.17. Labor cost came to $3.29 per mile. (Two men are needed, one for travel operation and the other for operating the boom and other controls.) Hence, the total cost of labor and fuel was $7.46 per mile.

Is the LPG burner accompanied by an extinguisher car? "It is generally our practice to operate an extinguisher car with the burner," said Mr. Beeder, "but the work of this force is nowhere as burdensome as it is when distillate is used."

THE CRANE straddles the track here as it loads rails in a yard. When unloading rail along the track it operates on the cars.

LOADING a compressor on a push car at a rail-laying job. The machine also serves as rail-laying crane when laying 39-ft rails.

They find many jobs for this la

Today it may be laying rail, or loading it, or unloading it. Tomorrow it may be installing a culvert 50 miles away. The next day handling timbers on a bridge repair project. These and many other jobs are all in the day's work for a rubber-tired crane that ranges the NP's Fargo division, working nearly every day of the year.

THE CRANE may load culvert pipe at the yard and then install it in the field.

● A 15-ton truck crane is being kept busy doing a variety of jobs for the B&B and M/W forces on the Fargo division of the Northern Pacific. Here are some of the jobs it's doing:

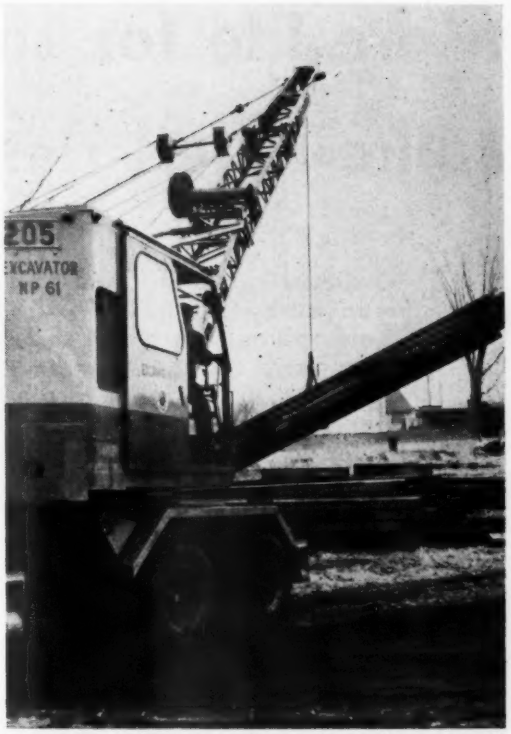
- Operating from atop the flat cars it unloads new rail along the right of way, and later, working alongside or astraddle the track, it lays the rail.
- When working on rail-laying jobs it handles small relay equipment to and from the track when clearing for trains.
- Working from the decks of the cars it loads old rails onto a string of flat cars in a continuous operation, moving from car to car.
- For bridge jobs within yard limits it loads timbers on push cars, then moves onto the bridge to unload the timbers for placement.

These are just a few of the operations for which the Fargo division is using the crane. It's a Koehring Model 205 crane mounted on an FWD rubber-tired carrier equipped with driving rear tandem. It has a 25-ft two-piece crane boom and two 10-ft extensions to give an overall boom length of 45 ft. The unit has automatic power boom lowering and handles ½-yd dragline and clamshell buckets. A ½-yd backhoe is also available. It is equipped with a 20,000-lb front-mounted winch so that it can be utilized to pull railroad cars.

The carrier, an FWD Model 64-402-CC, has an over-the-road speed of 30 to 35 mph, and is also geared for work in difficult off-road terrain. Made by the Four Wheel Drive Auto Company, the carrier is designed for heavy-duty crane operation.

Sharing responsibility for direction of the crane's activities are D. H. King, division superintendent, E. A. Panushka, bridge and building supervisor, and George K. Lamphier,

EQUIPPED with a dragline bucket the crane loads bulk material in a truck. This is only one of many material-handling jobs for which it is used.



HANDLING TIMBERS is another task for the crane. At bridge jobs it operates on deck when unloading timbers.

large truck crane

division roadmaster, all of the Fargo division. About 60 per cent of the time the crane is engaged in M/W work; the remainder of the time it is working on B&B jobs.

Maneuverability cited

Those in charge of the machine point out that the ability to drive the truck crane from one job to another is a highly important efficiency factor. After finishing one job the unit is frequently driven 50 miles or more to another spot in the afternoon to be ready for work there the next morning. It is not surprising, therefore, that the crane is in operation virtually every working day of the year, on routine jobs or in emergency situations, somewhere on the 1,250-mile division. All but six miles of this trackage are in North Dakota. Eastern limit of the division is the Dilworth (Minn.) yard just east of the Fargo-Moorhead area in North Dakota. Activities of the crane are centered at the yard at Jamestown, N. D.

Let's take a closer look at the crane in action doing various types of work.

In rail-laying operations involving standard-length rail the truck crane's role begins with the loading of the rail to be laid on flat cars. The crane is then loaded and secured, after which the crane and material are hauled by work train to the job. The unloading of the rail is done in a continuous operation without unloading the crane. Planks are laid between cars to facilitate movement of the crane from car to car.

When laying rail

Later the machine comes back and performs as a rail-laying crane. In this work the vehicle runs alongside the track where terrain permits, or on the track where necessary, to place the rail in the track. As already indicated it is also useful in handling other relay equipment to and from the track.

Still later the crane is called into action again to pick up and load the secondhand material. In this operation the unit operates on the cars in the same manner as when unloading rail. As many as 700 rails have been picked up in one day by this method.

Loading and unloading ties and other timbers in yards is another operation for the Koehring truck crane. It is used both with a sling for handling bundles of ties and with tongs for the larger, individual timbers. It also unloads and places ties and timbers for in-yard bridge work and spur-track construction or removal.

On culvert installation projects the crane does a variety of tasks. For instance, it may remove the rails, excavate the necessary opening, lift and place the culvert pipe, place the backfill and replace the rail.

Many earthmoving jobs

Earthmoving is one of the applications for which the machine is frequently used. Such jobs include ditching, building up approaches for roadways, digging out highway crossings in connection with ballasting operations, repairing washouts, and excavating for industrial site hydrants.

In the first 10 months of its operation, the Koehring crane covered 5,226 miles in moving from job to job on the Fargo division. This mileage was racked up in working along 200 miles of main line and on 10 branch lines of 1,050 miles.

More life for these spike-killed ties

Ordinarily, spike-killed ties must be removed because they have lost their ability to hold spikes firmly and to keep the rail at proper gage. In the New York subways the life of such ties is being prolonged by using larger tie plates held in place by Macbeth anchor spikes driven in sound wood. Tie pads are also used. This practice has made it possible to defer a larger expenditure for block-tie renewals.

1 Old plates are removed and tie indentations are filled. New plates are applied over tie pads

2 Rail l to pl

• The problem was what to do about these damaged ties. Located in a subway, they are the short (3-ft) ties typical of subway construction and are embedded in concrete. Some of them have been in service more than 30 years. The wood is, in general, in sound condition but the ties have been respiked so many times most of them are badly spike-killed. In addition, in many places the single-shoulder 8-in by 8-in tie plates in use have cut into the wood.

The obvious solution, of course, would be to renew the ties. But bear in mind they are embedded in concrete. The only way to get the old ties out is to break the concrete at the inside trough end. Then a wedge must be driven beneath the tie to raise it out of its pocket. Simultaneously, another wedge must be driven behind it to force it out. With some of the ties a complication is presented by bolts that anchor them to the concrete. Usually these cannot be backed out; the bolts either break off at the bottom of the tie or the tie must be broken up to get it out.

It can be seen, therefore, that renewing these ties is an expensive operation. In fact, the estimated cost of renewal for each short tie is $48, including material and labor.

This problem was encountered recently on the underground lines of the New York City Transit Authority. The ties needed attention promptly, but the high cost of renewal led to the consideration of other ways of handling the problem. This thinking centered largely around the possibility of taking measures to prolong the life of the ties. Ultimately it was decided that the life of the ties could be extended by taking these steps:

- Remove the small plates and plug the spike holes.
- Where the ties are plate cut fill the cavity with a plastic compound.
- Apply a tie pad over the tie-plate area.
- Apply larger double-shoulder tie plates (8 in by 14 in).
- On alternate ties drive combination spike-anchors in the hold-down positions.
- On the remaining ties drive cut spikes in the hold-down positions.

The key feature of this procedure is the fact that, by using larger tie plates in combination with a rail fastening that extends through the hold-down holes, it was possible to take advantage of the availability of sound wood outside the spike-killed areas.

Type No. 3 Macbeth spike anchors were used. This is a one-piece device, made of silico-manganese spring steel, heat treated and formed with two legs and a loop. The legs are driven into the hold-down spike holes of the tie plate until the loop bears on the top of the rail base with a predetermined pressure. Thus, the device acts both as a spike and an anchor.

The material used to fill the cavities in the ties due to plate cutting is called "Padarc" and was furnished by the American Railroad Curvelining Corporation. It is a resin plastic compound that comes in two parts. Just before use the two parts are mixed, resulting in a material with plastic qualities but which sets up quickly.

The problems involved in doing such work in a subway are vastly different from those encountered on open track, and progress is much slower. Where line-haul roads may set their maintenance goals at one mile of track worked per day, the NYCTA is satisfied with 300 ft per day. For one thing, most of the work must be carried out between midnight and six in the morning. That's the time traffic is the lightest and may be diverted to another track. Work crews are necessarily small in size and all hand tools must be insulated to reduce the accident hazard in the presence of the third rail. All materials must be brought in by work train, unloaded where space is at a premium, installed in areas of restrictive clearance, and the replaced material hauled out by train. Such work-

How the spike-driver works

The machine developed for driving the Macbeth anchor spikes is a pilot model built largely of materials on hand in the NYCTA maintenance shop. It consists of two units, a self-propelled driver and a power unit. The latter is mounted on a towed push car and consists of an electric motor, operating off the third rail, and an air compressor. There are four hammer units on the driver. These are arranged in pairs so that the anchor spikes on both sides of each rail can be driven simultaneously. Either pair can be cut out, if desired. Each unit is, in effect, an air-driven sledge hammer, and will drive the spikes, using four or five blows, in from two to three seconds. At the bottom of each hammer is a steel shoe, which fits over the preset anchor-spike. The hammer drives the spike down until the shoe prevents further driving. At this point, the spike has engaged the rail base with the correct compression.

2 Rail is lined and holes are drilled in the anchor-spike positions to place fastenings in sound wood. No line spikes are used.

3 Macbeth anchor spikes are used on every other tie. The legs are inserted in the anchor-spike positions and are set by hand.

ing conditions make the cost of all maintenance expensive.

With these conditions to contend with here's how the work was carried out:

While traffic is still running over the track the crew pulls all rail spikes on 10 rails except the large screw spikes, called "set" spikes, on every third or fourth tie. This crew also strips all anchors from the rail. As soon as this is completed traffic is diverted from this track and the crew raises the "set" spikes, which permits the rail to be jacked up. The old small plates are removed and the spike holes are plugged. The ties cannot be adzed but, where they are plate cut, the plate cavities are filled with the resin plastic compound.

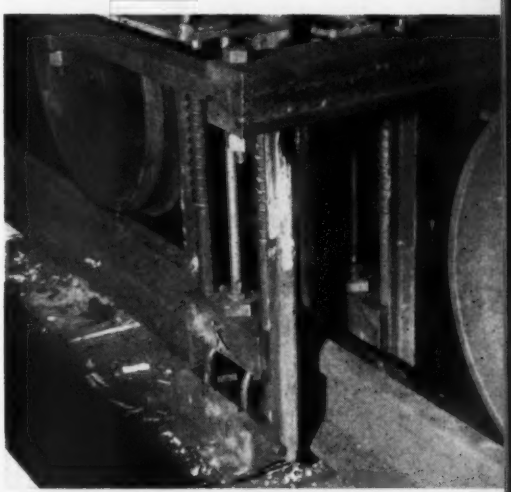
After this operation, a tie pad and a large plate are placed on each tie. The rail is lined, the plates and pads being moved with the rail. Holes are then drilled by an electric-powered wood borer, power being taken from the adjacent 550-volt third rail. The holes are drilled about 4½ in deep for both the spike anchors and hold-down spikes. A piece of adhesive tape, wrapped around the shank of the drill, helps the operator judge the desired depth. The cut spikes are then started with a maul in the hold-down positions and are driven down by a pneumatic spike hammer.

Driving the anchor-spikes

The Macbeth anchor-spikes are started by a man using a hand hammer or a maul. They cannot be driven with a conventional pneumatic spike driver because they are made of spring steel which absorbs the energy of the rapid blows by flexing. It is necessary to hit the spikes relatively slowly but heavily and both legs must be driven simultaneously. The NYCTA developed a machine for this purpose, in cooperation with the supplier, the H. T. Kennedy Company.

After three or four rails have been replated on one side, the crew goes back and brings the work forward on the opposite rail. The work is so planned that traffic can be resumed promptly at 6 am.

The work is being done by a crew consisting of a foreman and nine men. Cost of the work averages $6 per tie for labor, work train and material. It is anticipated that 40,000 ties will be so treated in 1958 at an expenditure of approximately $240,000. But by following this practice, an expenditure of $2 million has been indefinitely postponed.



4 Steel shoe fits over preset anchor spike and prevents overdriving.

5 Work is completed on three or four rails; then opposite rail is replated.

Should frog and switch designs be

This letter from W. E. Gardner makes a plea for more complete standardization of switches and frogs. While realizing the obstacles in the way of this goal, he is convinced that important advantages would be realized. What do others think? To find out, copies of Mr. Gardner's letter were circulated among the manufacturers and a representative list of maintenance-of-way officers. The replies are published below. While they indicate considerable uniformity of opinion in favor of standardization, the vote is by no means unanimous. *Editor.*

TO THE EDITOR:

It looks to me like the railroads are missing a good bet by not having common standards for frogs and switches. There must be a lot of railroad dollars that could be saved if we could just get away from the idea that everything we buy has to be custom-built to our own specifications. I know it's a hard job to get railroad engineers to agree on common standards for this material—they are just not good give-and-takers.

Besides the economy angle there are many advantages to being in agreement with your neighbors. Certainly we wouldn't be able to operate the system of railways we have if it wasn't for agreement on such things as the track gage, for instance.

Right now the closest approach to common standards for trackwork is in the plans and specifications prepared by the Track committee of the American Railway Engineering Association. However, this is still only an approach. To see why, we might consider the 16-ft 6-in switch as shown on AREA plan 111-55.

This switch is being made from many weights of rail. Individual roads could do something to help themselves about this aspect of the problem. A switch of one weight could be used with more than one weight of connecting track rail, allowing a reduction in inventories now and in the future. A better solution would be an agreement on what weights of rail for turnouts are essential to meet all requirements, thus

Opinions of manufacturers

Pledges "complete cooperation"—Mr. Gardner's letter is timely and points out some of the reasons why we have not yet obtained more standardization in turnouts. We can and should accomplish standardization through the cooperation of railroad users and manufacturers on the following points: (a) Rail section; (b) splice drilling; (c) design lengths; (d) angles or turnout number.

The AREA Committee on Track has appointed a sub-committee to study this subject and I believe they will report favorably. We hope the Track committee will initiate action to develop a single preferred standard in the AREA Trackwork Plans. We, as a manufacturer of trackwork, pledge our complete cooperation to such a program of action. Mr. Gardner's suggestion of a single rail section for main-line turnouts and packaged turnouts deserves careful study. *J. P. Kleinkort, Manager, Trackwork Products, American Brake Shoe Company, Chicago.*

Favors adoption of standard—The proposal made by Mr. Gardner is one that has been made previously by many people in the railroad industry. I find it difficult to determine wherein there can be any serious disadvantage to the railroads having a common standard for frogs, switches and their accessories. The American Railway Engineering Association has worked on this matter for as many years perhaps as it has been in existence. The fact that a common standard has not been adopted would seem to indicate that there must be disadvantages which are not apparent.

It is my understanding that a common standard for tie plates came about through an agreement among the manufacturers to make a common standard and not to make any departure therefrom except at a premium price. As a manufacturer of frogs and switches, I would favor the adoption of a common standard. *R. T. Reilly, President, Conley Frog & Switch Co., Memphis, Tenn.*

Have been "missing a good bet"—I agree with Mr. Gardner in that the railroads have been missing a good bet for years by not purchasing standardized trackwork. The basis for such purchases are, and have been for years, in the AREA trackwork plans, but they provide options or alternates which tend to neutralize the effect.

Standardization by the railroads' adoption of, say, only three rail sections and three standard turnouts in each of these rails would result in noticeable savings in cost of turnouts to most railroads, with consequently improved deliveries of material.

Standardization must be initiated by the railroads themselves, to realize the resulting cost benefits, since the manufacturers are willing to cooperate and help all possible to this end. *K. von Kampen, Chief Engineer, Pettibone Mulliken Corp., Chicago.*

Would result in lower costs—Standardization is essential for economy and successful operation of any business including railroads. Throughout the years the AREA has done a commendable job in standardization. However, its efforts have been limited because of differences of opinion of the engineers, which made many alternates necessary.

Standard designs are, of course, important, but the full reward of standardization of track structures will not be realized until railroads agree to use the same rail sections and joint bar drillings. If and when this is accomplished, the results will be lower costs and improved availability of such material. *M. J. Hassan, Vice President, Engineering and Operations, Taylor-Wharton Iron & Steel Co., Cincinnati, Ohio.*

Opinions of railroad men

Can't expect too much now—Standardization of trackwork is desirable and the efforts of the AREA committees have been directed along that line.

We have not yet reached a degree of perfection in materials and design to warrant standardization of other than general principles of design to be applied by individuals to fit hteir own problems. If we are to continue to have progress and improvement in materials and in design of fabricated parts, we cannot expect standardization which tends to fix things as they are.

The designs adopted by the AREA are at best a compromise of the thinking of some of the prominent engineers, sometimes incorporating faults while omitting desirable improvements resulting from individual research and ingenuity.

The AREA does not adopt plans covered by patents so that certain things which might be superior in design may be passed by and compromise plans adopted. Until such time as we have more perfect materials and proven designs, we cannot expect too much in the way of standardization of trackwork parts. *F. H. McKenney, Engineer of Track, Burlington Lines, Chicago.*

Says he is on "right track"—An analysis of plans used by most progressive railroads will show that the standards used for frogs and switches were, at one time, an AREA recommendation.

Without question, Mr. Gardner is on the right track and a uniformity of these standards is needed. Considerable progress was

be standardized?

allowing the manufacturer to reduce his inventories.

The plan calls for uniform riser plates—if you want graduated risers you have to go to plan 112-55. Both have merits but there is no need for two standards.

The switch is designed for a 6¼-in heel spread. For rails with a base width of 5½ in or less there are enough advantages in the use of a heel spread of 5¾ in to justify this smaller heel spread on lighter rail sections.

The plan gives you the choice of several alternates, such as the use of twin-hook plates in place of solid turnout plates, etc.

These are some of the differences in opinion that have to be eliminated before we have universally standard switches. The same applies to frogs.

I'm not willing to suggest that any individual start out to solve the problem. If he did, about the first thing he would bump into is a stonewall—there are a lot of engineers who will not agree with his ideas at all. Of course, he won't have to go too far until he finds one that will be enthusiastic about standardization—just so it doesn't mean any changes in his plans and specifications.

Right now I see no better way to get common standards than by backing up the work being done by the AREA. When the association can make plans incorporating what it considers to represent best practice without any need for alterates, and can carry out a campaign to get these plans universally adopted, then the manufacturers would be able to help.

It would be nice to have all in agreement so you could order a No. 10—115-lb turnout and have the fabricator load it from his stock and start it on its way. When we got it, we would have the frog, switch, guard rails, stock rails and closure rails ready to assemble—the switch stand and connecting rod could be included. We would no longer have to bother with the sorting, cutting, drilling and bending of the stock and closure rails. Some day, I hope this can be possible—but when practically all roads have individual standards it is asking too much from fabricators to carry these items for each road.

W. E. Gardner
Principal Assistant
Engineer
Wabash
St. Louis, Mo.

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made by a number of railroads in the St. Louis area. Meetings were held at Chicago, working toward the same end, but fell through when the major users lost interest. Undoubtedly, considerable improvement could be made by the formation of an active committee consisting of maintenance and chief engineers, who recommend standards to their management. Such a committee could work toward greater uniformity and, in addition, analyze the cost effect of changes when recommended by the AREA committee. *J. T. Fitzgerald, Engineer Maint. of Way, Chicago, Rock Island & Pacific, Chicago.*

Would lead to "standard" prices—One cannot dispute the statement that adoption of standard plans for trackwork would benefit both railroads and manufacturers. The first step should be standardization of rail sections. In a recent five-year period four manufacturers rolled rail in 36 patterns, 62 per cent of which was in two sections, 115-lb and 132-lb. Adoption of these sections as standard for all frog and switch work, and with fabrication according to a generally adopted AREA plan, should permit manufacturers to place standard prices on products so manufactured. Railroads requiring frogs and switches based on alternate plans or on other rail sections would expect to pay premium prices. This would encourage adoption of uniform standards. *J. C. Jacobs, Engineer Maintenance of Way, Illinois Central, Chicago.*

Says common agreement not possible—Mr. Gardner's letter very adequately outlines the variations in turnout design which now exist on our railroads. As you know there is a subcommittee of AREA Committee 5—Track, which is considering this very problem.

Inasmuch as we still have latitude for free expression of design, our turnouts on individual roads will be designed to fit existing layouts and operating conditions (for interchangeability) and no common agreement, in my opinion, is possible.

Should the railroads ever become influenced by an outside body (such as the ICC or equal), then a standardization would be placed into effect which would be followed by all railroads, but not necessarily to the satisfaction of each individual line. *K. E. Dunn, Engineer Maint. of Way, New York Central System, New York.*

". . . impeded by personal feelings . . ."—I am fully in accord with Mr. Gardner's basic idea and I recommend his letter for careful consideration by railroad track maintenance people. Paraphrasing what Mr. Gardner says, progress towards this much desired end is, no doubt, unnecessarily impeded by personal feelings or an inordinate pride in our own plans. *W. E. Cornell, Engineer of Track, Nickel Plate, Cleveland, and chairman, AREA Committee on Track.*

Cites results of standardization—The large-scale production of a standardized item will result in economy. It is obvious that volume production of a particular item will result in a lower unit cost as compared with small runs of many different designs only slightly at variance with each other. Retooling costs are saved as well as the expenses of training personnel in the different designs. Standardization of frogs and switchs will result in the following:

(a) Eliminate expense of design plans, a better product due to industry-wide focus, reduce tendency for inconsequential revisions, and simplify railroads' plant inspection.

(b) Orders will be filled quicker and with keener competition.

(c) Manufacturer may stockpile at shops, reduce special inventory of plates, reduce supervision in shops, and save on labor turnover.

(d) Deliveries can be made directly to the job when required and thereby reduce stock in railroad stores.

(e) Delivery of frogs and switches will be better coordinated with the trackwork program. It will also be possible to borrow from a neighboring railroad and have a nationwide testing ground for the materials.

It is not a simple matter to get the representatives of the various railroads in the country together on a particular design of frog or switch. Apparently the most opportune time to coordinate on a standardized track material is when the railroad adopts a new weight of rail. . . . *W. R. Bjorklund, District Engineer, Northern Pacific, St. Paul, Minn., and chairman Track Committee Subcommittee on "Economies to be gained by the railroads from the more extensive use of AREA trackwork plans."*

Suggests territorial standards—Standardization of switch material—all track material for that matter— is an excellent thought and should be in the back of all maintenance officers' minds, if they are not already actively doing something about it. I do not think the plan can be adopted universally at one time, but I do think that roads operating in one territory or one section and drawing from one or more suppliers in that territory could standardize. This would go a long way to alleviate the present situation. It would overcome the almost impossible obstacle of all railroads agreeing simultaneously on one common standard. By standardizing in certain territories complete standardization could undoubtedly be achieved. *H. M. Williamson, Engineer Maint. of Way and Structures, Southern Pacific, San Francisco, Calif.*

Loading old ballast in tunnel . . .

FOULED ballast had to be removed after one track had been taken up and the other thrown to the center line of the tunnel.

TRAXCAVATOR, working in cramped space, side-dumped the muddy material into air-dump cars without excessive turning.

● Boston & Maine's Hoosac tunnel, built in 1875 in western Massachusetts, is a double-track bore, 25,081 ft long, designed to fit the cars of that period. But the piggy-back operation of today requires more headroom than was available.

B & M officers decided that the best answer to this problem would be to remove one of the tracks and shift the other to the center line of the tunnel. This would provide additional overhead clearance by taking advantage of the arch of the roof. It also was decided that the old ballast should be replaced as it had become badly fouled.

The work was to be done under traffic. This indicated a machine which could load the material into work-train cars for outside disposal and yet be small enough to be in the clear of trains passing through the tunnel. Also, because of the limited working room between the work-train cars and the tunnel walls, it required a machine which did not have to turn to unload. It was decided that two Caterpillar No. 933 Traxcavators, equipped with side-dumping buckets, would fill these requirements.

Accordingly, these units were sent to the tunnel and work was started in May 1957. The Traxcavators scraped up the material and, without excessive turning, loaded the fouled ballast into air-dump cars. When the cars were taken away for unloading or for clearing for trains, the Traxcavators worked at stockpiling the muddy material until the cars were returned. Work is scheduled for completion in October of this year.

Two jobs for tractor-excavator

● Front dumping proved satisfactory for a project on the St. Louis-San Francisco. Washed-in material and wasted old ballast had accumulated along the shoulder of the outside track of its switching yard at Cape Girardeau, Mo. This condition prevented adequate drainage and made it difficult to maintain the desired surface on the track.

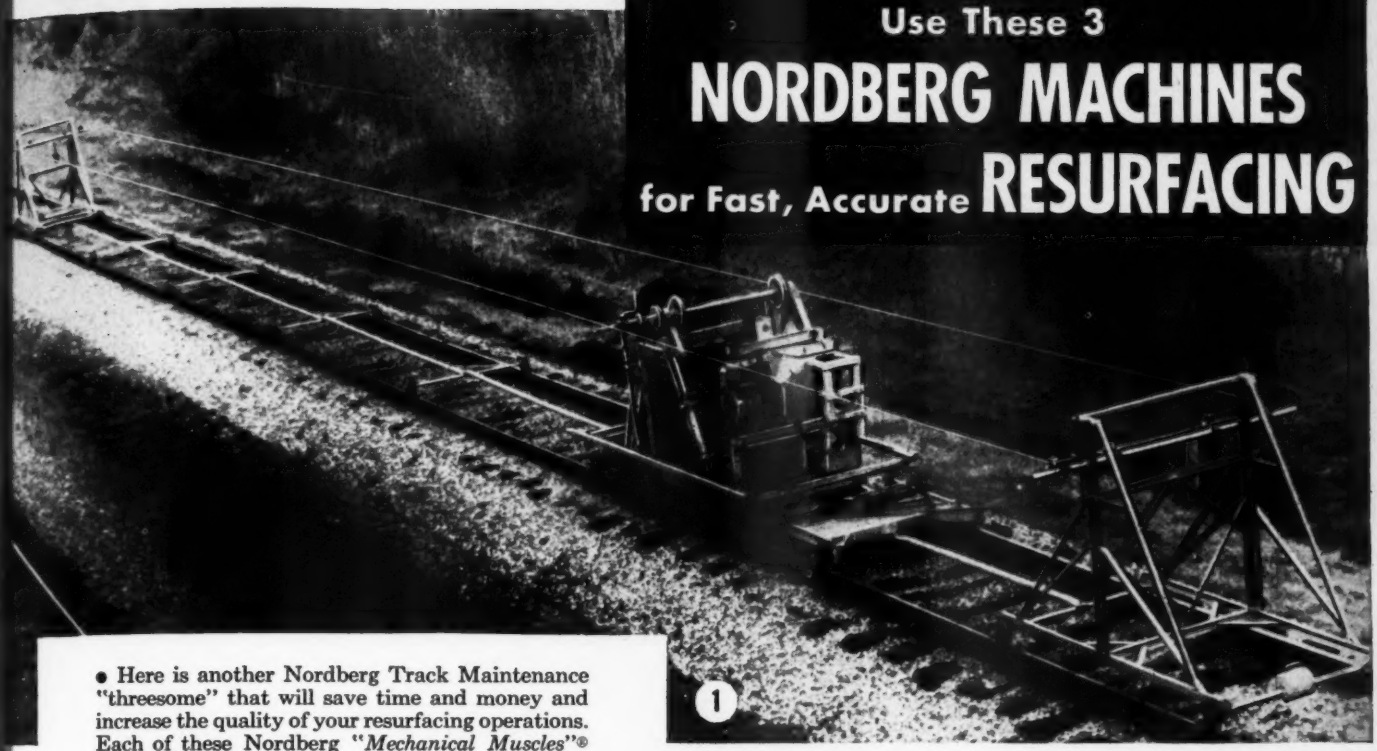
Frisco officers decided to operate raising and tamping equipment on this and adjacent tracks to restore the surface. Before doing so, however, the drainage had to be improved. It was planned to use a Traxcavator with a front-dumping shovel bucket to dig down the shoulder about 10 in at the tie ends and dispose of the material at low spots along the right of way. The plan proved satisfactory as the machine lowered the shoulder along three miles of track in one month.

Improving drainage in a yard . . .

WASTED ballast and washed-in material were dug out along the tie ends by a tractor-shovel to improve drainage, hauled to low spots along the right of way, and dumped.

Use These 3

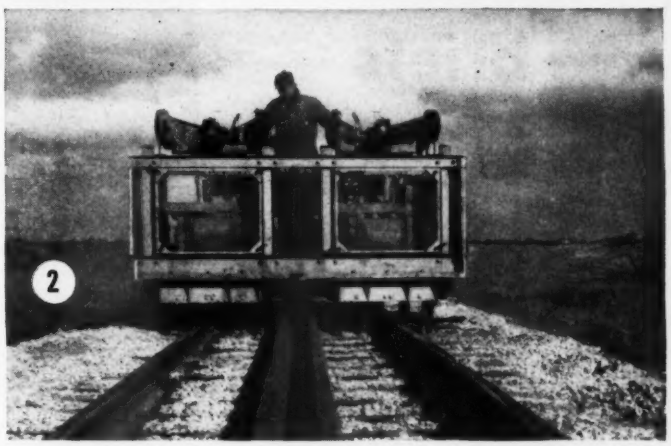
NORDBERG MACHINES for Fast, Accurate RESURFACING



• Here is another Nordberg Track Maintenance "threesome" that will save time and money and increase the quality of your resurfacing operations. Each of these Nordberg "*Mechanical Muscles*"® is ruggedly built to do a specific job . . . and do it better, faster and at lower cost. Proved cost savings will soon write off your original equipment investment on each of these machines.

1 TRAK-SURFACER—TAMPING POWER JACK TEAM

The Nordberg Trak-Surfacer is an entirely new method of producing improved profile and surface that has proved its speed and accuracy on a number of the Nation's major railroads. The Trak-Surfacer employs a tightly drawn wire as a reference line for raising the Grade Rail. A Nordberg Tamping Power Jack, used as the central unit, raises the track to the wire, tamps the tie to hold the raise and provides propulsion power for itself and the entire Trak-Surfacer.



GANG TAMPER

2 Sixteen point tamping for raising or spot surfacing, this one-man machine tamps by impact, compression and vibration, with split tamping heads that tamp under one rail or both, as desired. Assures uniform quality tamping of every tie, every time, in any ballast.

NORDBERG "LINE INDICATOR"

3 Quick, lower cost lining of curves and tangent track is now possible with the Nordberg Line Indicator. Using the well-known Trakliner® as a central unit, this new "Mechanical Muscle" does the complete job of sighting and lining track.

© 1958, Nordberg Mfg. Co.

R-358

WRITE FOR TRIAL-LEASE PLANS

NORDBERG MFG. CO.
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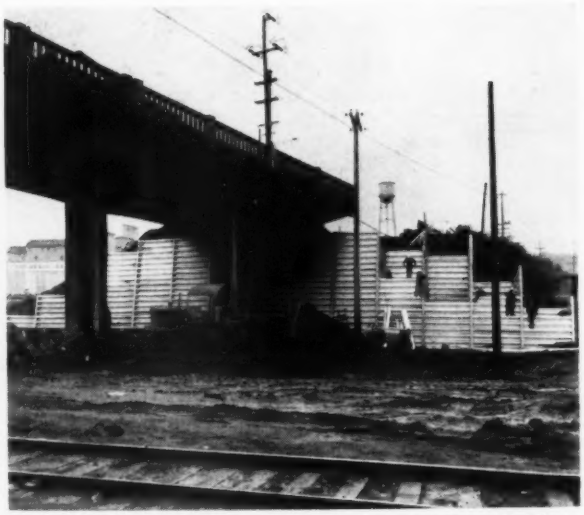
NORDBERG *Mechanical Muscles*®

ONCE known as the "world's largest freighthouse," this facility of the Chicago & North Western at Proviso yard is being torn down. Built 30 years ago for handling lcl business, its removal was inevitable in face of the steady decline and changing pattern of lcl traffic. Its removal will ultimately make room for more classification tracks at the double-hump yard.

SKYLIGHT of this station at Zurich, Switzerland, is built of a new material made in this country. The translucent fiberglass plastic panels were made by Filon Plastics Corp., El Segundo, Calif.

News briefs in pictures

AIR-CHARGING time for freight trains has been reduced as much as 45 min to 1½ hr by the Southern at 16 of its freight yards. Air lines were extended with 4-D wrought-iron pipe laid along the tie ends. Outlets are available about every 1,000 ft.



METAL bin-type retaining wall was used by the Union Pacific to replace embankment slope under city bridge at Portland, Ore. Costing about $45,000 for materials, erection and backfilling, this project enabled the road to construct additional yard tracks.

Effective brush control with "Ammate" in Mississippi. Note cotton and other crops adjoining right-of-way have not been harmed by "Ammate" application. "Ammate" is non-volatile . . . can be used on rights-of-way even where they adjoin cropland planted to sensitive crops like cotton, tobacco, grapes, tomatoes, soybeans and peanuts.

For long-term brush control without crop injury use Du Pont AMMATE®

WEED AND BRUSH KILLER

Railroads throughout the country are turning the unique advantages of Du Pont "Ammate" Weed and Brush Killer into maintenance savings. "Ammate" assures long-term brush control, which means lower maintenance costs. When the original spray job is thoroughly done, only subsequent occasional spot sprays are needed to keep brush under control for years.

"Ammate" kills more kinds of brush than any other brush killer. "Ammate" is non-volatile, and because of this feature it can be used on rights-of-way even where they adjoin cropland planted to sensitive crops.

Cut your maintenance costs; rely on Du Pont "Ammate" for long-term brush control.

• *Du Pont "Ammate" Weed and Brush Killer is available in solution (tank-car quantities) or crystalline forms.*

For economical, long-lasting weed control, use Du Pont TELVAR®

MONURON AND DIURON

weed killers

Du Pont "Telvar" weed killers, used separately or in combination with sodium chlorate or weed oil, provide the base for efficient, economical weed-control programs. Continuing tests conducted by the Association of American Railroads indicate that such herbicidal combinations offer long-term residual control.

"Telvar" weed killers come as wettable powders, are non-volatile, non-flammable, non-corrosive and low in toxicity to humans and livestock. One application of "Telvar" controls weeds for a season or longer . . . saves you handling and storage space . . . cuts annual maintenance costs. Add effectiveness and economy to your weed-control program with Du Pont "Telvar" weed killers.

Du Pont Technical Service representatives are available to discuss your weed- and brush-control problems. Contact the District Office nearest you. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

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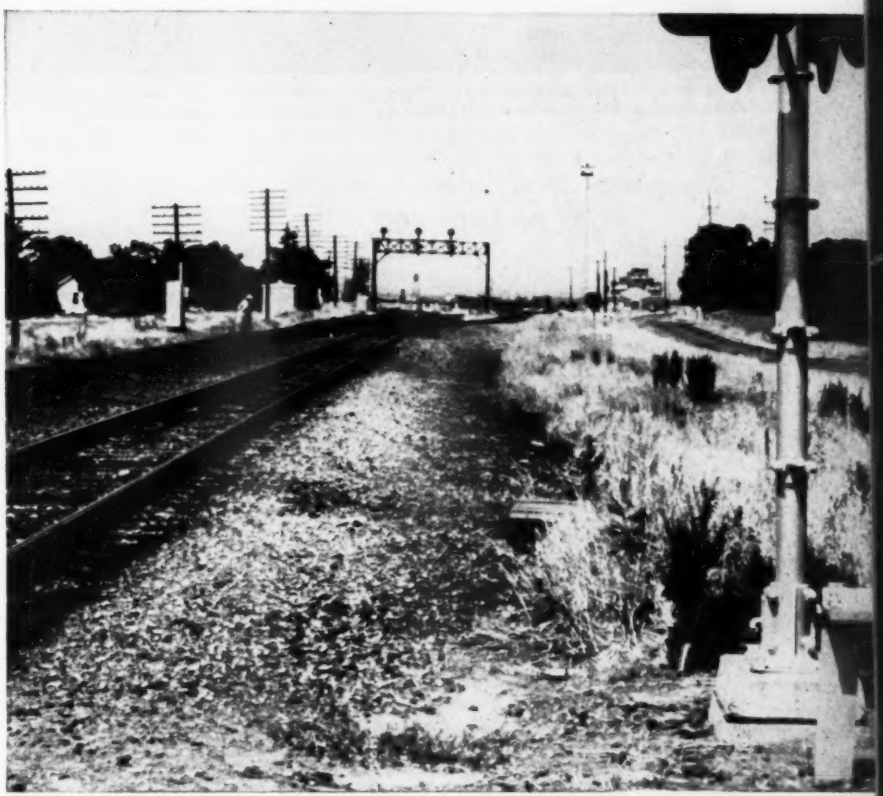


Excellent weed control from "Telvar" W monuron weed killer on the Southern Pacific. The results shown here illustrate the unusual residual properties of "Telvar" weed killers.

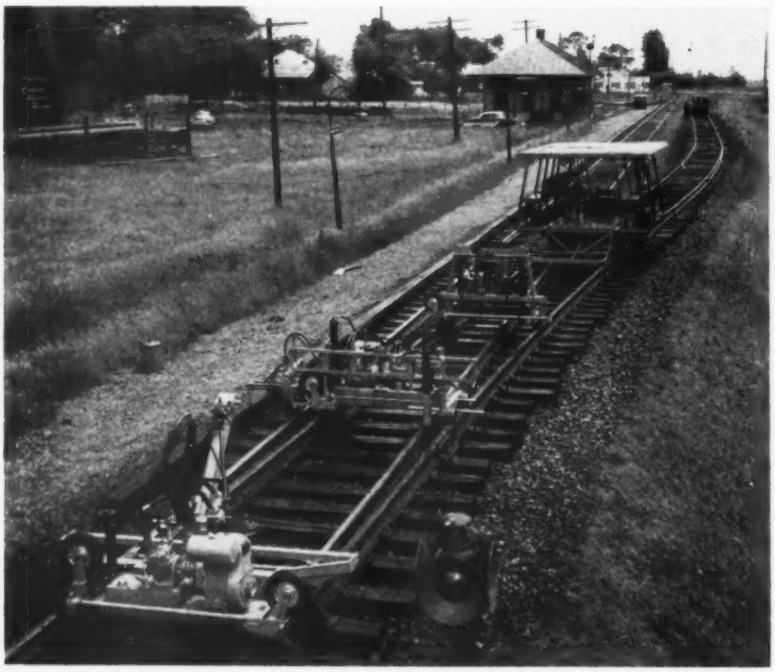
On all chemicals, follow label instructions and warnings carefully.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

WEED and BRUSH KILLERS

Products



THE MULTI-GANG package unit. Beginning in the foreground, the machines are the Hydrillbolter, the Hydrejector-Hydrenewer, the Comboliner and the Main Car.

Gang versatility with . . .

M/W package unit

TIE-RENEWAL, raising, surfacing and lining operations are all possible, according to the manufacturer, with the use of a single outfit of machines designated the Multi-Gang Package Unit. In addition, this equipment will pull and drive spikes, run up and tighten track bolts, and drill bolt holes in rails. The package unit consists of four hydraulically operated machines. They are designated the Main Car, the Hydrillbolter, the Spike Hydrejector-Tie Hydrenewer, and the Comboliner.

The Main Car carries the tamper machine. The latter has a split crosshead, each side of which works independently of the other. This machine has a powered downfeed which is said to "nip up" dangling crossties. It is claimed that the machine will tamp up to 600 ft per hr.

The Main Car also serves as the transport unit for as many as 13 men as well as for the other machines of the package outfit. It is equipped with a hydraulic tail rack over which the three smaller machines can be rolled up or down between the deck of the machine and the rails. Powered by a 30-hp air-cooled gasoline engine, it is hydraulically propelled at speeds up to 25 mph.

Another feature of the Main Car is its ability to remove itself, together with the loaded machines, from the track at virtually any location. This is accomplished by two crawler tracks mounted transversely under the machine, enabling it to be steered like a conventional bulldozer on the right of way. Dimensionally it is 171 in long, 113 in wide and 84 in high.

The Hydrillbolter is a combination rail drill and bolting machine. The bolter has a single control lever. This machine features an automatic change from high-speed low-torque for running up nuts to low-speed high-torque for nut tightening. It will handle nuts on either side of both rails. The drill attachment is adaptable within 2 min time. It is said to drill a 1 ⅛-in diameter hole in 1½ min. Manned by one operator, the Hydrillbolter can be removed from the track by two men.

The Hydrejector-Hydrenewer is a combination spike puller and tie renewer. It is said to be capable of pulling from 20 to 25 spikes per minute and has a transverse carriage to facilitate the movement of the puller from one rail to the other. It is converted from one operation to the other by the movement of a lever. As a tie renewal unit it will renew from 15 to 20 ties per hour, according to the manufacturer. Powered by a 9-hp air-cooled gasoline engine, the machine hydraulically forces ties from beneath the rails without, it is said, disturbing the track. Eight strokes of the mechanism are required for either the removal or insertion of a tie. It is equipped with handles and set-off wheels so one man can remove the machine from the track.

The Comboliner is a combination powered jack and track liner. It has rail dogs which automatically engage the rails and a hydraulically operated foot plate which lowers onto the crib. A vertical hydraulic ram at each end of the foot plate effects the track raise. A cross-level indicator, reading in inches, assists the operator in determining the correct horizontal position of the rails. The foot plate also contains a double-acting hydraulic cylinder for lining purposes. When lining track, the operator inserts two lining anchors in the crib and operates the foot-plate ram, which exerts up to 10,000 lb of thrust in the desired direction. The machine also is equipped with retractable set-off handles and wheels, as well as a turntable for turning the set-off wheels to the desired side of the track. *Tamper, Limited, Railway Division, Dept. RTS, 160 St. Joseph St., Lachine, Montreal 32, Quebec.*

For extra-tough digging . . .

Rock backhoe bucket

WEIGHING 725 lb is a new heavy-duty rock bucket for use on the Bantam goose-neck backhoe attachment. An outstanding feature of this bucket is its heavy construction which is said to make it ideal for digging in extra-tough ground conditions and rock. It is 25 in wide and has side bits 1 in thick and a bottom bit ½ in thick. It is adaptable to the goose-neck backhoe design on the manufacturer's carrier-mounted, crawler-mounted, or self-propelled crane-excavators. *Schield Bantam Company, Dept, RTS, Waverly, Iowa.*

Why are there two elements in the BULLDOG anchor?

Listen to this conversation between a track maintenance man and a True Temper engineer.

A. No other construction permits such a tremendous amount of holding power. The two elements actually multiply and sustain the gripping power of each other.

Q. Wouldn't a single clamp, or a single spring, do as well?

A. No. Most rail anchors are simple one-piece torsion springs. They grip the rail base with horizontal force. Only the BULLDOG uses both horizontal and vertical force —a combination that increases holding power 25%.

Q. Well, how do these two elements do that?

A. One element is a spring, tempered for resilience. It functions like ordinary anchors by gripping the rail horizontally. The second element—and here is where the BULLDOG is unique—is a double-jawed clamp of hardened steel. This is fitted to the spring to add vertical force by gripping the rail at the base.

Q. And this actually increases holding power?

A. Absolutely. Precision tests prove it. The BULLDOG's two-way grip, using both horizontal and vertical force, gives you much more holding power. And, after all, holding power is what you're buying in a rail anchor.

Q. Okay. But isn't this anchor harder to apply?

A. Not at all. It's *assembled at the factory* into one unit that's very easy to ship, handle and apply. It has all the convenience of a one-piece anchor. Track workmen like it because one man can install it easily with any striking tool—sledge or spike maul. And to make application even more economical, True Temper now offers two machines—one hydraulic, the other mechanical—that do the job almost automatically.

Q. Do other railroad men agree with you?

A. They certainly do. Over half the railroads buy the BULLDOG, and the number is increasing. It's the fastest-growing rail anchor in the business.

Want to hear more? Just contact your True Temper representative, or write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio.

OTHER TRUE TEMPER RAILWAY PRODUCTS: Track Shovels • Ballast Forks • Weed Cutters • Hammers • Sledges • Scythes • Safety Rail Forks

TRUE TEMPER. BULLDOG RAIL ANCHORS YOU CAN LOOK TO TT FOR LEADERSHIP

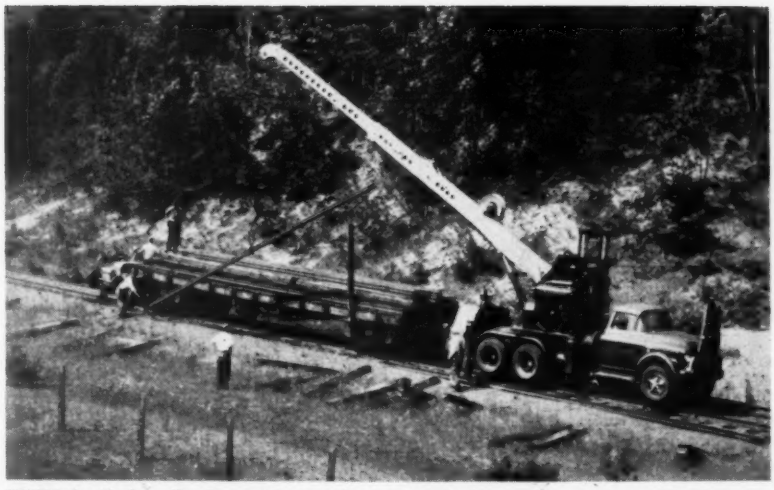
Versatility features . . .

Railroad-highway crane

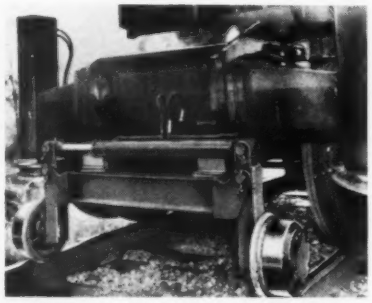
DESIGNED for multi-purpose use is a new railroad-highway truck crane, designated the H-5 Hydrorailer. It is rated as a 12-ton crane and can be equipped with a number of attachments, including a ½-yd digging clamshell or a ¾-yd materials-handling bucket. The Hydrorailer can be used to handle rails, lay tracks, install signal systems, and for bridge construction and maintenance work and other jobs along the right of way.

The Hydrorailer is an H-5 Hydrocrane, mounted on a tandem-axle truck to which two sets of rail wheels are attached. Wheels are raised and lowered hydraulically from the operator's station in the crane cab. The wheels are roller-bearing mounted. Only the inside rear truck tires ride the rails. Slow speeds, both forward and reverse, are permitted by a special transmission. Off the rails, the truck can move between jobs at speeds up to 50 mph.

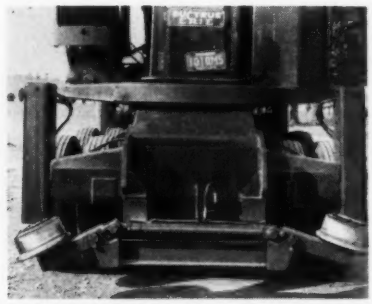
On and off the rails, one man controls crane and clamshell operations. He can powerset quickly four hydraulic outriggers to form a stable, level working platform. The machine can lift more than 70 ft when using a 20-ft jib and intermediate boom section. The three-piece boom extends to 50 ft and retracts to 26 ft. Other attachments available include pulpwood grapples, a hydraulic auger and a 39-in magnet. *Bucyrus-Erie Company, Dept. RTS, South Milwaukee, Wis.*



WHEN the Hydrorailer is working on the track only the inside rear tires ride the rails.



FLANGED wheels in the lowered position.



FLANGED wheels in the retracted position.

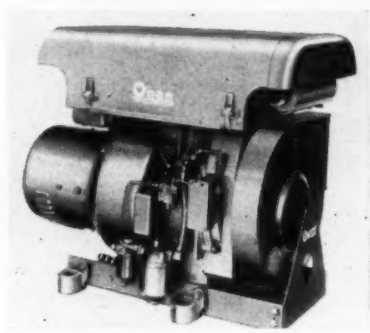
Full loads insured by . . .

DT Fullpak scraper

INTRODUCTION of the Model DT Fullpak scraper marks the completion of the manufacturer's program for converting all of its tractor-drawn scraper models to the faster, easier-loading Fullpak design. Model DT is an 11.5-cu yd scraper for use with tractors of 70 hp or more. The 27-yd BT and 18-yd CT Fullpaks were introduced last year.

The DT Fullpak is said to have a clean, smooth bowl interior to minimize resistance to loading and unloading. The bowl floor, which provides approximately 28 sq ft of load base, measures only 40 in from the tip edge of the cutting blade to the face of the tailgate, minimizing the distance which material must travel to get into the bowl. The DT's three-section blade is 8 ft 4 in long. Its blade tilt and scraper-bottom design produce a full boiling of materials which, it is said, virtually eliminates voids and fills bowl corners and apron for extra heaping loads. The scraper's rear wheels are set well within the blade width for maximum controllability in making accurate cuts.

When discharging, the DT's apron swings up to provide an opening of a full 5 ft high for quick unloading. The machine's overall length is nearly 29 ft, yet it is said to require less than 26 ft of space to make a complete 180-deg turn. *Le-Tourneau-Westinghouse Company, Dept. RTS, Peoria, Ill.*

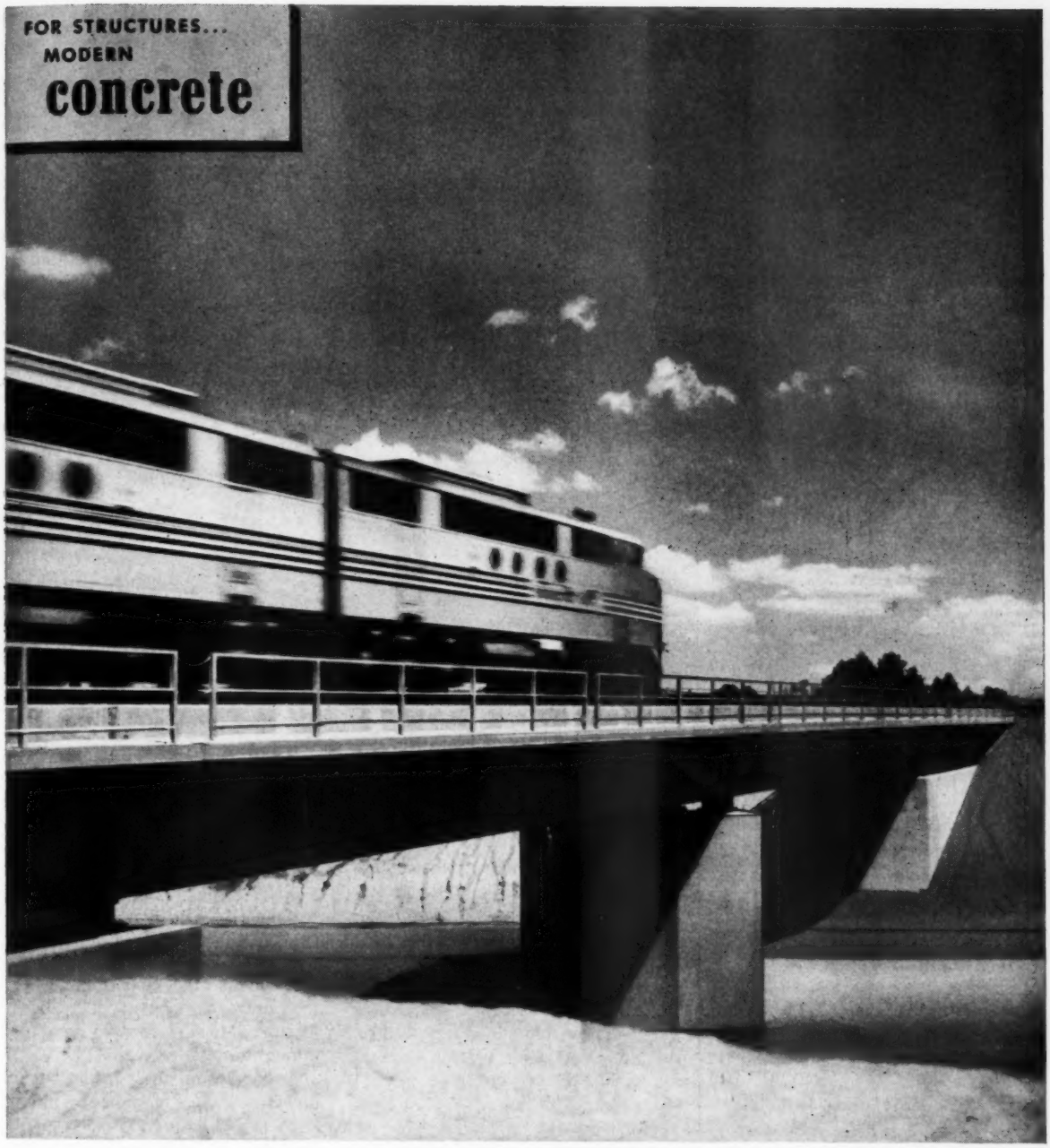


Special cooling on . . .

Generating plants

ENCLOSED locations may now be used, it is said, for the installation of a 3000-watt air-cooled diesel-electric generating plant without fear of overheating. The feature that makes this possible is an exclusive cooling system on DSL models. Designated "Vacu-Flo," the vacuum cooling system employs a powerful centrifugal blower for pulling cooling air through the generator and over the heated engine parts, then expelling the heating air through a duct to the outside. The enclosed compartment may be just slightly larger than the unit in size, it is said, with allowances made for an air-intake and an exhaust outlet.

The new DSL models are said to be highly suited for mobile and portable use. Weighing 470 lb, a plant can be taken anywhere in its own trailer, or can be easily installed in a pick-up truck. A new steel turret hood permits all-weather operation. In addition to the standard voltages of 115, 115/230, 230, 60-cycle, the DSL plants can be obtained in 24-30-volt, 32-40-volt and 110-140-volt battery charging models. Fifty-cycle models rated at 2,500 watts, also can be supplied. *D. W. Onan & Sons, Inc., Dept. RTS, Minneapolis 14, Minn.*



At the USAF Academy . . .

Santa Fe bridges use prestressed concrete girders to span 70 feet for E-72 loading!

CONCRETE blends beautifully with U.S. Air Force Academy architecture. And Cooper's E-72 loading meets Santa Fe requirements.

Engineers achieved both beauty and strength with prestressed girders and a cast concrete deck. And girders are *three times longer* than ever used before for prestressed railroad bridges.

Maintenance costs stay low. No painting needed. Concrete won't rust, rot or burn. No vibration. That's why more and more progressive American railroads are turning to durable concrete to improve service and save money.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

What's the answer?

To be answered in November

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: September 30

1. What corrective measures can be taken during extended, wet, rainy periods to check surface slides on high fills? Explain.

2. What yardstick should be used for determining the stocking of repair parts for powered M/W equipment? Explain.

3. When is it practicable to "post" a pile which has deterioriated at the ground line? Explain how this work should be done. Is there any limit as to the number of piles which can be posted in a bent?

4. How should spikes be placed and driven when applied at joints haveing toeless bars? Why?

5. When leaks occur in built-up roofs, how can these spots be located and patched? What are the practical or economical limits to such patching? Explain.

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Fire breaks for trestles

How far apart should fire breaks be placed on long timber trestles? How should they be constructed and of what materials?

Space Closer

By F. E. GLADWIN
B. & B. Supervisor
Northwestern Pacific
San Rafael, Calif.

At the present time and in the past we have been placing fire breaks at distances of 400 ft and 500 ft apart. Due to increased costs of both labor and material, I believe the distance should be not over 250 ft. Also, the break should be constructed of concrete and steel.

Treat the wood

By J. W. ROWLAND
Assistant Engineer of Construction
Long Island Railroad
Jamaica 35, N. Y.

Fire breaks on timber trestles of any great length should be placed a sufficient distance apart to prevent the fire from jumping from one section to another. Also, they should provide sufficient fire-retardant qualities to the deck to afford this protection.

On the Jamaica Bay trestle of the Long Island, a structure four miles long and now rebuilt and operated by the New York City Transit Authority, we had the last fire some 8 or 10 years ago. This burned 1,200 ft in less than two hours because we had fire breaks that were inadequate. They consisted of ⅜-in iron plates which covered the bents from base of rail to low water. In width they extended about 12 in beyond the double-track trestle. They were 48 ft apart with the intervening spaces treated with fire-retardant ties and stone. One fault was that this distance was not sufficient and should have been at least 100 ft. In addition the stringers had not been broken at the iron-faced bents. Furthermore, the plates were cut around the 8-in by 16-in wood stringers which continued through the plate protection.

The placing of effective fire breaks would appear to be influenced by the following:

(1) The type of fires encountered.
(2) The height of the structure over land or water.
(3) The velocity of winds encountered.

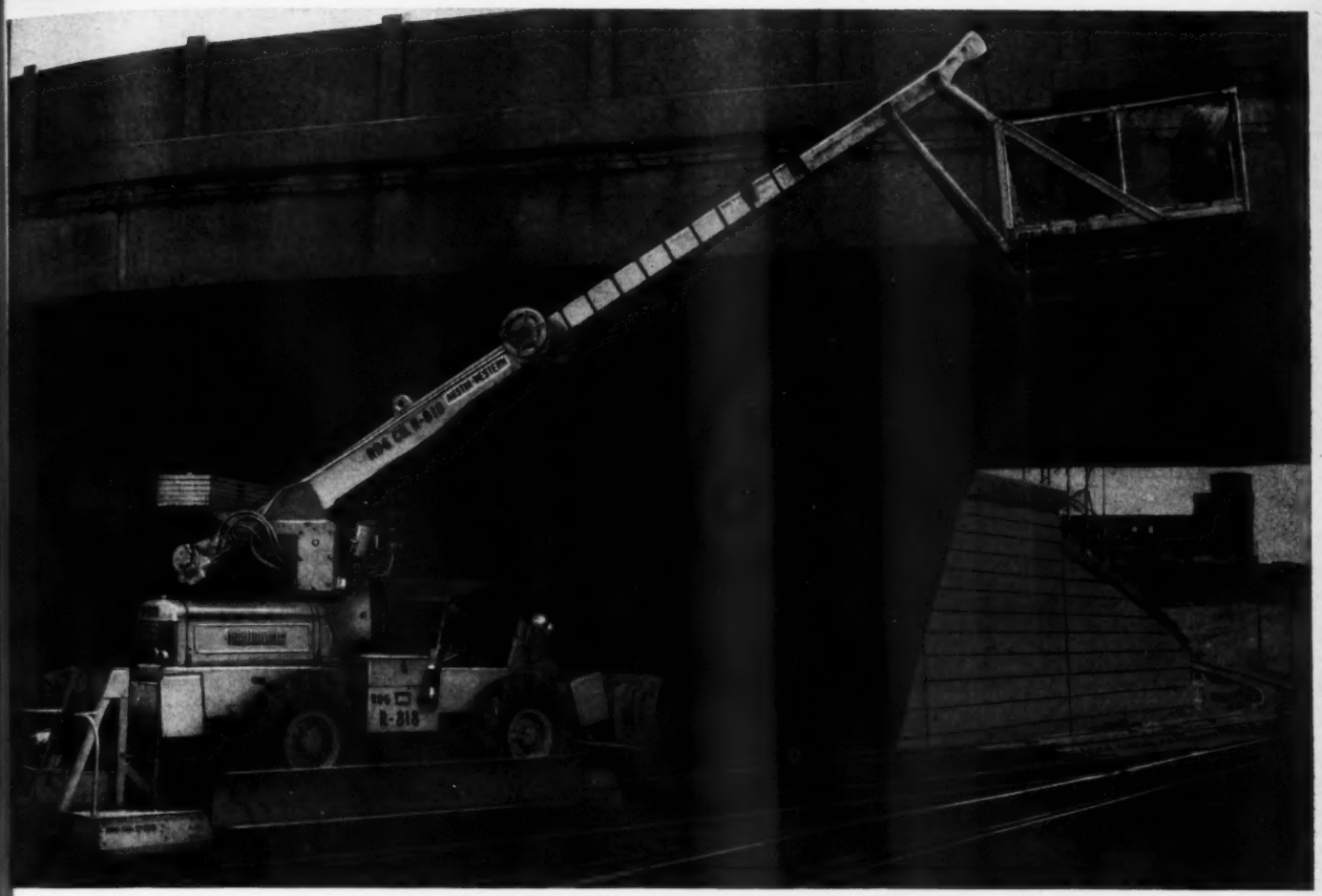
To illustrate the first instance, our Jamaica Bay trestle was double track, over water, and subject to hundreds of small fires and some disastrous big ones. Fire watchmen usually took care of the majority of fires. Causes were cigarettes thrown out of passenger cars by passengers, sparks from third rails, and sparks from brake shoes. Cigarettes caused about 60 per cent of all fires.

These all began on the top surface. It was apparent that the best protection would be a continuous fire-retardant deck. If the trestle had been over land then consideration would also have to be given to the possibility of vandals and others who might create a fire from the ground. This could be very serious on high trestles.

We have found that treated timbers have a higher resistance to fires than untreated timbers. They have a resistance to surface splintering for a greater number of years.

In conclusion, these facts would indicate that at fire breaks a double bent should be used. The two bents should be separated to provide a clear space of 10 in to allow for the construction of a concrete wall from the ground or water level up to the base of rail. The wall should have wings of steel or concrete extending laterally on each side at least 4 ft from the ends of the ties or foot walk. A similar fire break should be constructed about 100 ft beyond the first. The intervening deck should be adequately protected from falling sparks by fire-retardant treatment of small stone over pitch or asphalt coating.

The distance between fire breaks is determined by the insured replace-



Workmen using maintenance platform to remove loose concrete from bridge.

Versatile Austin-Western Hydraulic Crane: valuable off-track on-track workhorse at Reading Co.

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ment value. We found that replacing 1,000 ft of double-track trestle on an emergency basis costs about $500,000. If this amount of insurance is carried, 1,000 ft of trestle can be replaced without financial loss. However, there will be delays in service. Frankly, I think there is no adequate method of protection except complete fire-retardant treatment from end to end of the structure and fencing in of land areas below the trestle to protect it from vandals. This is comparatively cheap compared to other methods.

Strainers in pipe lines

Under what conditions is it desirable to use strainers in pipe lines ahead of pumps? What determines the mesh size of the strainer basket and also the need for cleaning.

Use in all cases

By J. Y. NEAL
Principal Assistant Engineer
Norfolk & Western
Roanoke, Va.

We believe that, in all cases, strainers should be used ahead of pumps. They are required whether the pumps are for permanent installations, for portable pumps used for emergencies, for projects requiring the mixing of water for concrete at outlying points, for furnishing emergency water for engines, or for other facilities.

We have used various types of strainers. Some are purchased from manufacturers and some are made in our shop. Some are the home-made basket type, and others are the cylindrical or pipe-type strainers.

The size of the mesh in strainers is determined by the locality where the pump is to be used, the condition of the water to be pumped, and the amount of silt and size of debris in the stream or body of water being pumped. The size of the strainer is determined by the volume of water required, and the size of pump.

The cleaning of the strainers is accomplished by use of a blow-back pipe connected with the suction line. Pressure is supplied from the storage tank, or by a return blow-back line from the pump. Another method of cleaning is by the hinged-suction line, counterweighted so that strainers can be raised for cleaning manually.

Where dirt is present

By R. H. MILLER
Maintenance Engineer
Lake Superior & Ishpeming
Marquette, Mich.

First, and most important in considering a strainer, is the product being conveyed. Second in importance is where it is to be used. Obviously, a pump conveying water for normal shop use would not require a strainer ahead of it. But, one conveying fuel for an internal-combustion engine, or fluid to be sprayed through small nozzles (such as weed spray) would require a strainer ahead of it.

One manufacturer of pipe fittings expressed the need quite thoroughly when he said ". . . strainers provide protection for equipment having internal moving parts or small passages where dirt, scale, grit, or other foreign matter carried in the fluid may cause damage. They may be used on steam, water, oil, gas and air lines."

As to the size of the mesh in the strainer basket, I would have to depend entirely upon the supplier's recommendations. I would specify the fluid to be conveyed when ordering the strainer.

The need for cleaning the strainer basket would depend entirely upon local conditions and experience. On one hand, I have seen strainers in diesel-fueling stations cleaned only during monthly inspections. On the other hand, I have seen strainers on a weed sprayer that had to be cleaned as often as every 10 min. At any rate, a regular inspection of any equipment using strainers ought to include the removal and cleaning of the strainer basket.

Condensation in concrete-block buildings

In buildings constructed of concrete blocks what problems are encountered due to condensation of moisture on the interior wall surfaces? What measures can be taken to overcome these problems? Explain.

Face with brick

By G. P. WALKER
Supervisor B. & B.
Missouri Pacific
Monroe, La.

Concrete blocks are widely used for many types of construction. I do not consider them desirable for single-wall construction for office or store buildings. However, they do have a place in this type of construction when used for walls that are to be faced with brick or other masonry. I do not believe that moisture will have any notable affect on them when so used.

Considering their use for single-wall construction in small buildings, such as garages, service stations, storage warehouses, and factory buildings where moisture does not cause much concern, they should give very satisfactory service.

Consideration is always given to foundations when using any type of masonry construction. But, for concrete-block construction, special consideration should be given to the foundations. This is because, for single-wall construction, concrete blocks do not have the key effect that bricks have. Hence, if the foundation is not properly constructed, zig-zag cracks or separation in mortar joints will occur in the walls, making

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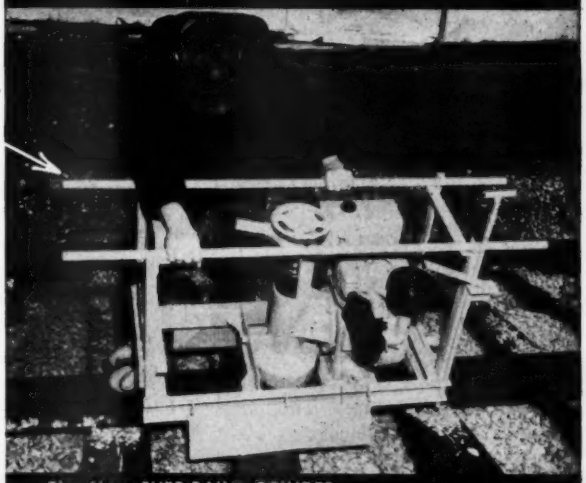

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them hard to waterproof. In some cases, cracks will go through the full wall thickness.

There are several name brands of waterproofing materials sold. Some are very effective for moistureproofing concrete blocks, providing that everything else as outlined above has been given consideration.

Watch dew-point

By W. C. PANARESE
Railway Representative
Structural & Railways Bureau
Portland Cement Association
Chicago, Ill.

Moisture will condense if the surface of a concrete masonry wall or any other surface is cooler than the dew-point temperature. The dew-point at which condensation takes place varies with the temperature of the air and the amount of water vapor in the air. To avoid condensation on interior wall surfaces, either the wall temperature must be kept above the dew-point temperatures; or the moisture content of the air must be kept below the relative humidity at which condensation will occur.

Condensation can cause several problems. It may mar a decorative wall treatment; cause warping and other damage to baseboards; damage carpeting or other floor coverings; or corrode metal heating registers, fixtures, and electric outlet boxes. The problems which can occur are almost too numerous to be mentioned here.

There are several ways in which condensation may be corrected or prevented. The usual procedure is to construct a wall with sufficient "U" value (resistance to heat transmission) to maintain an interior surface temperature above the dew-point temperature. A second solution is to blow warm air against the wall. This air flow should be in sufficient volume to raise the interior surface temperature of the wall above the dew-point temperature for the particular relative humidity that occurs within the building. A third method is to reduce the relative humidity within the building below the critical point by using a dehumidifier.

There are many ways in which a concrete masonry wall may be constructed to "build-in" necessary insulative properties. Concrete blocks made with lightweight aggregates have better insulating properties than those made with sand and gravel or crushed limestone. For example, a wall made with 12-in sand and gravel or limestone block (cores not filled and no plaster) has a "U" value of 0.49 while the same wall made with 12-in expanded slag, clay or shale block has a "U" value of 0.32.

Another way to reduce the "U" value would be to apply plaster directly on the block. Still better would be to fur, lath and then plaster. The use of insulating board beneath plaster is also effective. A variety of "insulating board" products is available made of treated glass fibers, expanded polystryrene plastic, vegetable fibers, gypsum, etc. Wood paneling furred out may also be satisfactory in some applications. All of these methods will lower the "U" value of the wall. "U" values are like golf scores, the lower the better.

Filling the cores of concrete block walls with granular insulation material will improve the thermal properties of the wall. Precautious must be taken, however, to keep the insulation dry in the cores.

A cavity wall, consisting of two walls separated by a continous air space, provides a wall with excellent thermal properties. This type of construction may be applicable in some instances.

The American Society of Heating and Ventilating Engineers Guide, or the local FHA Minimum Property Standards, may be consulted to help determine "U" value requirements for exterior walls.

Concrete masonry walls should alway receive an exterior surface treatment to prevent moisture from penetrating the wall through the exterior surface. Two coats of portland cement base paint, well scrubbed into the pores of the block and properly cured with a fine fog water spray, is highly effective as weatherproofing. The National Bureau of Standards Report BMS 110, "Paints for Exterior Masonry Walls," reports that portland cement base paints have high durability ratings and remain bonded to masonry long after many other types of paints have eroded or flaked away.

Use of heat-treated rails

Under what conditions is it desirable and economical to install heat-treated rails in running track? Alloy-steel rails? Explain.

Superior on curves

By R. B. RHODE
Asst. Chief Engineer
Duluth, Missabe & Iron Range
Duluth, Minn.

Both heat-treated and alloy-steel rails are demonstrating their superior qualities over ordinary control-cooled rail in selected applications. Their resistance to shelling, abrasion, and flattening has been shown. It is both on curves and in switches where their installation is economical.

On curves, where there is a severe abrasion problem, either heat-treated rail or chrome-vanadium alloy-steel rail are superior to ordinary control-cooled rail. I have found from observation of C-V rail tests that this rail has a greater resistance to abrasion than the heat-treated rail. C-V rail is also economical to install on the low side of curves. Here it has been demonstrated that its life is sufficiently greater than ordinary rail to warrant its use. The capability of C-V rail in resisting lateral flow is much greater than ordinary rail.

A definite specification for the use of either alloy rail or heat-treated rail cannot be established. Each curve location must be investigated so that the nature of the wear on the rail can be determined. If subject to severe abrasion or head flow, either one of the special types of rail should be used, except that C-V alloy rail

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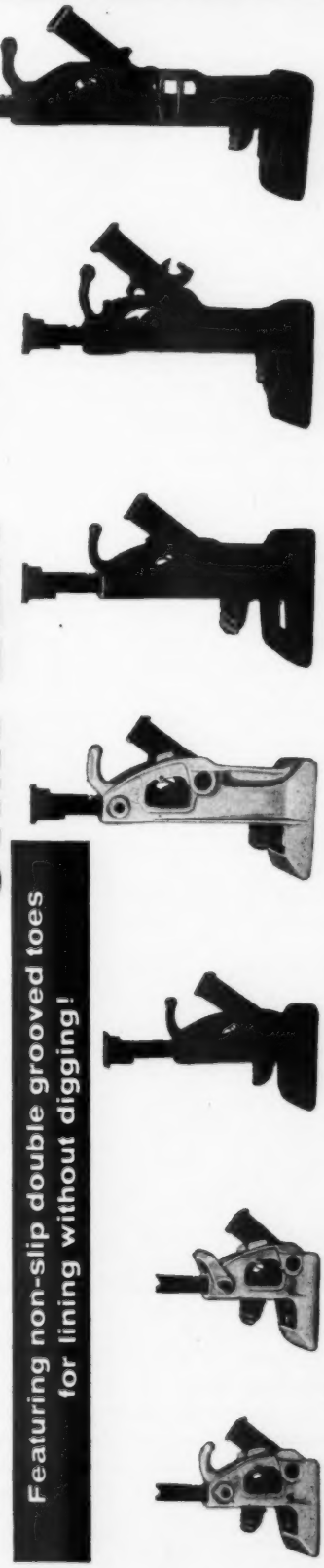

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will prove to be more advantageous than heat-treated when used on the low side of the track.

Produces savings

By J. M. SALMON, JR.
Chief Engineer
Clinchfield
Erwin, Tenn.

It appears to me that every person charged with the responsibility of track maintenance must constantly search for materials and methods which will produce the maximum return for the money expended. Rail, along with other track materials, represents a considerable proportion of the annual necessary maintenance expense.

Those who have light-traffic high-speed track to maintain are probably not too interested in either heat-treated or alloy-steel rails. However, the tracks which are curved, particularly curves of six degrees and more, coupled with heavy freight tonnages, present a rail problem. To me the adoption of the 131-lb section over the 100-lb section was a real saving on such track. Probably there were many who felt that this was the answer.

My first experience was a test begun in 1941 on a 10-deg curve handling approximately 18 million gross tons of annual traffic, principally coal. Prior to the installation of the 131-lb section, the 100-lb low rail was removed as scrap at approximately 27½ million gross tons of traffic and the high rail was transposed to the low side. After installation of the 131-lb section, the rail was used until it had handled 50 million gross tons. It was then transposed, with the high rail laid on the low side and low rail on the high side. At 120 million gross tons and nearly 7 years after the original laying, this rail was removed and laid in a yard lead. The monetary saving of 131-lb over 100-lb on this curve was $1.32 per ft of track, or $6,969.60 per mile. One interesting observation was the wear pattern. The heavy wear occurred between 54 and 78 million gross tons.

In evaluating the results of the various tests conducted and sponsored by the AREA, the steel industry and the railroads, it appears to me at this time that heat-treated rails present savings. There should be a reduction in abrasion, shelling, flaking, and detail fractures from shelling. Without estimating the savings which will result in less frequent laying of rail, less frequent transposing, and less frequent testing, there appear to be adequate savings to justify heat-treated rail on curves.

At the present time we will lay heat-treated rails of 132-lb RE section on all curves of 6 deg and up. Our rail at the mill is priced in the quantities which we purchase as follows:

Control - cooled, end - hardened, chamferred and drilled $5.658/cwt.

Control - cooled, heat - treated, chamferred and drilled $8.956/cwt.

To me this means that, based upon price alone, there is a minimum increase in tonnage traffic life of at least 300 per cent for an initial cost increase of 59 per cent. With our traffic tonnage, which varies from 15 million to 23 million gross tons annually (the tonnage being 18 million or greater over 70 per cent of the main-track mileage), the use of heat-treated rails on curves of 6 deg or more will make a very definite maintenance saving. Our composite alinement is as follows:

Alinement	Track-miles
1 deg curve	10.87
2 deg curve	24.49
3 deg curve	13.47
4 deg curve	15.04
5 deg curve	8.54
6 deg curve	14.35
7 deg curve	4.00
8 deg curve	5.54
9 deg curve	3.26
10 deg curve	8.89
11 deg curve	1.14
12 deg curve	.87
13 deg curve	.64
14 deg curve	3.42
Tangent	162.32
Total	276.84

We could well be in a cycle or period, such as we have passed through, where heavier rail produced savings on heavy-tonnage curved track. Now heat-treated rail of the same weight will produce savings over control-cooled heavy rail on curves. Alloy-steel rails may be the ultimate answer. I am not conversant with the availability and price of alloy-steel rails. My thought is that further research and testing of alloy-steel rails are needed. Until research and tests indicate that alloy-steel rails are the most economical, I believe that demand will not justify sufficient rolling and that heat-treated rails will provide the saving on curves.

At special location

By J. P. LEAHY
Assistant Engineer
Central of New Jersey
Jersey City, N. J.

The use of heat-treated rails is particularly desirable and economical at certain restricted locations where the wear throughout the entire length of a rail is the principal and primary reason for periodic and frequent renewals. It is quite evident that these locations are on various curves throughout the lengths of most railroads. It is quite difficult to definitely specify actually what degree of curve should be considered for the installation of heat-treated rails. The type of traffic hauled (loaded cars, light cars) and the direction of the predominating grades could vary the amount of curve wear, paricularly on double or multiple-track lines and branches.

Our experience on a single-track railroad in mountainous territory has shown that both the high and the low rail of curves should be changed approximately every two years where the curvature is between 9 deg and 13 deg, and approximately every 4 years on curves between 5 deg and 9 deg. This cycle may vary somewhat where rail lubricators are used but these are average conditions where the rail lubrication is nominal. The additional cost of heat-treated rails could be justified by comparing this cost with the cost of changing rails at given intervals. With the rising labor cost, the conversion to single track in CTC territories and the ever decreasing amount of time available for changing rail, it becomes quite evident that in the near future extensive use must be made of this type of rail.

I can see no immediate advantages to using heat-treated rail on tangent track since the entire life of a rail can be obtained when rail is laid in these locations. It is a common practice on our railroad to have the ends of all rails laid heat-treated under all con-

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Versatile L-W Tournatractor can help other equipment as well as work independently. Here it push-loads a 9-yd D Tournapull®, which is handling long-haul earthmoving along right-of-way. Tournatractor can mount a variety of dozing tools, tow work units. Coupler-equipped model, the SwitchTractor, spots rail cars on emergency request.

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ditions and locations. This procedure is recommended for all roads whether these ends be treated at the mill or in the field.

The next most advantageous use of heat-treated rail is in main-track high-speed switch work. A definite economic advantage can be gained by using it as stock rails, switch points and closure rails on the curve leads. Use in this manner will lengthen the life of the switches in the same proportions as it does on curves.

The use of alloy-steel rails should be confined to special trackwork layouts such as slip switches, crossing frogs, guard rails, miter rails, car floats, etc., where shock and abrasion forces are the greatest. This type of rail cannot be welded by the oxyacetylene method. Therefore, minor repairs are very costly. Alloy-steel rails, unlike heat-treated rails, cannot be economically welded together to eliminate the joints or produce continuous rail. It is felt that any extensive use of alloy-steel rails on heavy curves or high-speed switches would cause a considerable increase in the wearing of car and engine wheels. In the long run this would defeat any savings that would be made by the use of this type of rail to gain a longer life.

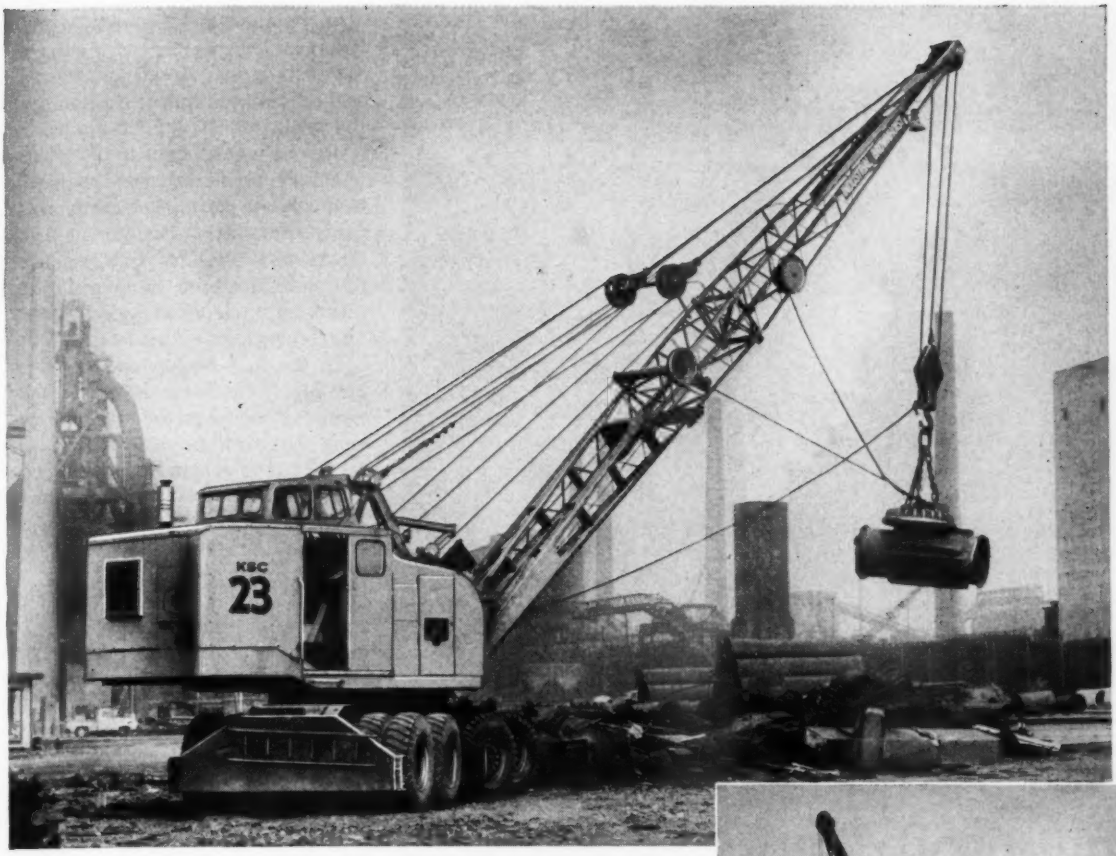
Placing signs on poles

What are the advantages, if any, in moving roadway signs out of the way of track equipment by placing them on the nearest telephone poles? What signs can be moved? Explain.

Too far out

By H. C. MINTEER
Division Engineer
Chicago, Milwaukee, St. Paul & Pacific
Milwaukee, Wis.

The question of moving signs comes up many times when M/W equipment is to work over a section of track. Many signs, if not relocated,



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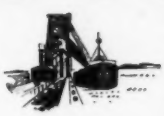
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CONTINENTAL IS ON THE MOVE IN 1958

What's the answer? (cont'd)

will be damaged during the course of the work.

Relocating the signs to the nearest telephone pole could possibly be the best solution during certain types of work where heavy changes are to be made in the physical structure of the railroad. However, moving signs to the nearest telephone pole has definite drawbacks.

In the first place, roadway signs are placed as information for the train and engine crews and for trackmen. Placing these signs on the nearest telephone pole moves them a considerable distance from the track. This increases the possibility that an important sign, such as a whistle sign or a reduce-speed sign, might be overlooked and a serious accident could result. In the second place, many railroads have telephone poles on one side of the track only. Placing roadway signs on the opposite side from where they normally would be again brings up the definite possibility of the signs being overlooked, with possible serious consequences.

In conclusion, it would be my recommendation that roadway signs should not be placed on telephone poles except in extraordinary cases. It is preferable that the present signs and posts be moved just far enough from the center of track to permit the operation of roadway machinery. In some cases it may be necessary that longer posts be furnished so that the signs will be easily visible to train and engine crews and maintenance-of-way personnel.

Go around some

By R. F. Bush
Engineer Maintenance of Way
Lackawanna
Scranton, Pa.

When marginal roads are constructed on fills or through cuts for use of off-track roadway equipment, track signs, mile posts, signals, relay cases, etc., are very definite obstacles.

Mile posts can be moved to the edge of the fill or to the toe of the cut. Speed signs for the allowable speed on curves are left in place adjacent to the track and the marginal road is constructed around them, as also is the case where signals and relay cases are involved.

Generally speaking, our pole line is located at too great a distance from the track for the the speed signs to be attached to the poles. Each sign on this railroad has its own supporting post.

Roadway signs have never presented too great a problem in the construction of marginal roads. We generally have sufficient room to increase the width of the marginal road at these locations, as well as at the wayside signals and their appurtenances.

Few advantages

By Track Supervisor

It would seem to this writer that the advantages of moving roadway signs out of the way of track equipment, particularly by placing them on nearby telephone poles, would be few if any at all.

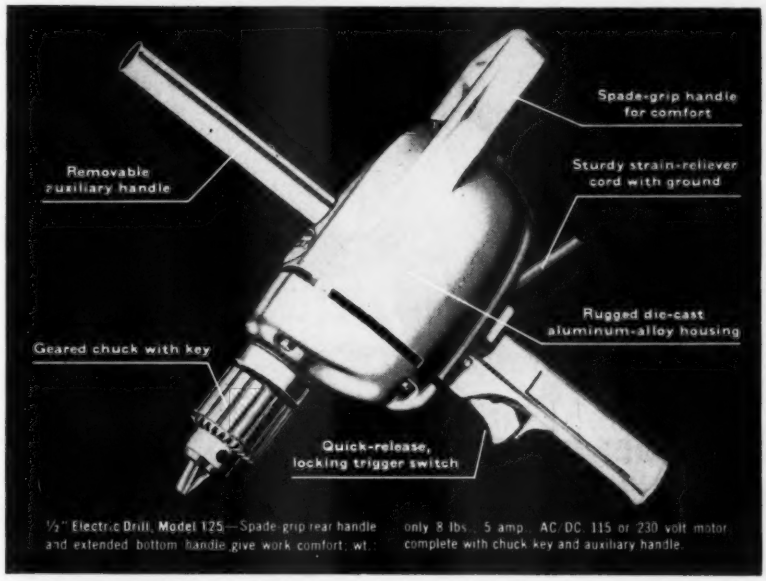
Few signs are, or should be, actually close enough to the track to interfere with the operation of track machines. On most lines, the minimum allowable distance from center of track to any adjacent structure, sign, pole, etc., is 10 ft. If a sign is placed at this distance, it will be approximately six feet from the ends of ties. This distance should be ample to clear any track machine and the operations of nearly all of them. Possible exceptions to this might be ballast equalizers with extended wings or on-track ditching machines. Tie-renewal operations are inconvenienced only slightly by the proximity of a sign. The operation of other machines, such as tampers, rail-layers, rail-testers and rail-lubricating machines, is not affected by signs. Operation of on-track weed and brush sprayers is rarely affected by them.

Cost would be high

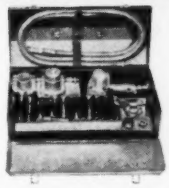
An occasional relocation of a sign to a telephone pole might conceivably be justified if the original location proved to be inconvenient. But even this should not be considered if the interference is only infrequent. Otherwise, the cost of a mass relocation of signs would be prohibitively high.

Brackets would have to be made up for attaching signs to poles. This alone would involve a tremendous cost. Further, many roads use concrete sign posts. These would almost

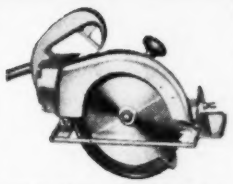
POWER to boost job efficiency with REMINGTON tools


Spade-grip handle for comfort
Removable auxiliary handle
Sturdy strain-reliever cord with ground
Rugged die-cast aluminum-alloy housing
Geared chuck with key
Quick-release, locking trigger switch

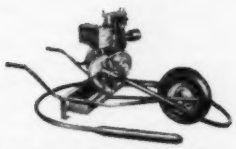
½" Electric Drill, Model 125—Spade-grip rear handle and extended bottom handle give work comfort; wt. only 8 lbs.; 5 amp., AC/DC, 115 or 230 volt motor complete with chuck key and auxiliary handle.



Mechanics' Maintenance Kit, Model MM-43—Air-powered (Model MM-40: electric-powered) impact wrench with multi-purpose accessories.

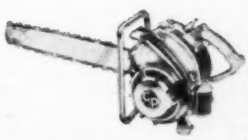


10" Electric Saw, Model 106—Rugged 13-amp, 115 or 230-volt AC/DC motor; cuts full 3⅜". Complete with blade, wrench and carrying case.



Concrete Vibrator, Model 7GV—A 5-hp, gasoline-powered unit from the industry's broadest line of air, electric and gasoline-driven models.

Powerful, rugged, easy to handle—Remington Power Tools help you boost output and ease the tough jobs. They're precision-built for long service and minimum maintenance. Your Remington distributor stocks and services the industry's widest selection of power tools and parts.



Golden "Logmaster" Chain Saw, 5-hp. Roller-Bearing nose boosts chain power up to 20%. Outcuts and outlasts other chain saws in its class.

Submersible Pump, Model PSP-602 with powerful air motor—completely submersible; pumps 14,000 gallons per hour against 10-ft. head.

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Bridgeport 2, Connecticut
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Bridgeport 2, Connecticut

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ELECTRIC PLANT
NEWS

3,000 watts

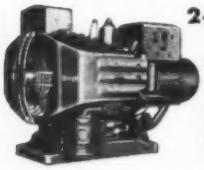
New Onan all-purpose Diesel Electric Plant cuts costs in half!

Lower fuel cost, less maintenance, longer life, cut power generation costs with the Onan 3DSL to half that of small gasoline-powered electric plants! For applications requiring an almost continuous supply of electric power, this new unit gives you unmatched economy and *season after season* of service.

Lighter weight and compact

The new 3DSL is powered by an Onan single-cylinder, air-cooled full-Diesel engine. Available in all standard A.C. voltages and as a 32-volt battery charger. Vacu-Flo cooling, permitting enclosed installations, is standard. The 3DSL has a new mounted muffler, more efficient dry-type air filter, new geared crank, and it's hooded for protection on the job. Smoother running, lighter weight, and compact.

New lower price makes it an even bigger value . . . allows you to "go Diesel" for more power generation needs.



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SERIES 5DRP. Air-cooled horizontally-opposed, smooth-running full Diesel engine. All standard voltages available. A higher capacity unit for continuous, low-cost operation.

Onan A.C. gasoline-powered plants: Air-cooled—500 to 10,000 watts. Water-cooled—10 to 150 KW.

See your Onan distributor or write for information

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What's the answer? (cont'd)

have to be replaced with signs of lighter and more easily attached materials. Other types, such as those of cast iron, would be very difficult to attach to poles.

On most lines there will be a pole line only on one side of the track. Hence, there will probably be objections to relocating some signs to the opposite side of the track from the original location. Also, in most instances, pole lines are considerably farther from the track than are the sign posts, often as much as 25 or 30 ft and more. Locating signs this far from the track, particularly if the poles are on top of a cut or at the base of a fill, could result in the sign being obscured or otherwise rendered ineffective.

Not all signs could be placed on telephone poles. Signs such as whistle posts, yard limit, station approach and other directive signs might be so placed. But, as stated previously, objections to relocating these to the opposite side of the track from the original location might arise. Mile posts could hardly be placed on a nearby pole unless the pole just happened to be exactly opposite the original milepost location, or unless the new location was referenced to the old. Otherwise the exact mile point would be lost. Cross-buck signs could be placed on poles only if one was conveniently located to the crossing.

If signs are to be relocated, consideration should be given to doing this in line with routine replacement of signs. A number of roads are now replacing old-type signs with new reflectorized ones. Relocation of signs to telephone poles, if desired, might be accomplished during such a program. In that case, signs should be made of lightweight materials and designed specially for attaching them to poles, that is, with brackets as integral parts of the signs.

One advantage to placing signs on poles would be that they would be less subject to damage when unloading roadway materials. This also would apply to overhanging loads and other objects projecting from the sides of trains. However, reasonable care in unloading materials would eliminate most damage from that source and damages from the other are very infrequent.

Biographical briefs (cont'd)

(*Continued from page* 10)

Union Pacific (announced elsewhere in this issue), started his railroad career as a laborer on the San Pedro, Los Angeles & Salt Lake in 1906 at the age of 16. He worked as a laborer and steam shovel crane man until December 31, 1909. On July 20, 1912, he joined the Oregon Short Line, a subsidiary of the Union Pacific, as a locomotive crane operator. Mr. Wade subsequently served on the OSL as a steam shovel engineer, snow plow operator, roadway equipment operator, supervisor of motor cars and repair shop foreman. On November 16, 1936, Mr. Wade was appointed supervisor of work equipment on the Union Pacific at Omaha, being further advanced to general supervisor of work equipment at Salt Lake City, Utah, on September 1, 1942. He returned to Omaha in the same capacity on February 1, 1946, remaining at that location until his recent retirement.

Albert B. Watkins, who has been appointed bridge and building supervisor on the Southern at Charleston, S. C. *(RT&S,* July, p. 10), is a native of Talbott, Tenn. He entered the service of the Southern as a bridge and building apprentice in May 1937. Subsequently he served as B&B helper, B&B mechanic, assistant B&B foreman and B&B foreman. In September

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1956, he was appointed scale inspector at Knoxville, Tenn., which position he was holding at the time of his recent promotion.

Association News

Track Supply and B&B Supply groups to consolidate

Member companies of the Track Supply Association and the Bridge & Building Supply Association have voted unanimously to merge the two groups into a single association. The vote was counted at separate meetings of the associations held on July 1 at the Conrad Hilton hotel, Chicago. The new organization will be known as the "Association of Track and Structures Suppliers."

The next step will be to nominate officers for the new association. This will be done at a meeting on August 19 of the Executive Committees of the two present associations. The first annual meeting of the new association is scheduled to be held at the Conrad Hilton hotel at 10:30 am, September 17, at which officers will be elected.

It is understood that the new association will take over the sponsorship of the annual banquet held during the concurrent conventions of the Roadmasters' and Bridge & Building Associations, and will also sponsor the exhibits that are held at intervals during these conventions.

Roadmasters' Association; Bridge & Building Association

The Program committees of both associations have practically completed plans for the annual conventions which will be held concurrently at the Conrad Hilton Hotel, Chicago, September 15-17.

In general, the separate sessions of the two associations will consist of the presentation of committee reports, most of which have been completed, plus a number of addresses or other special features on timely subjects.

Final plans for the Bridge & Building convention were made at a meeting of the Executive Committee held at Chicago on June 30 under the direction of W. H. Huffman, president of the association and assistant chief engineer of the Chicago & North Western. The Executive Committee of the Roadmasters Association held its final meeting in Chicago on July 14. That meeting was directed by E. L. Anderson, president of the Roadmasters' Association and retired chief engineer of the St. Louis-San Francisco.

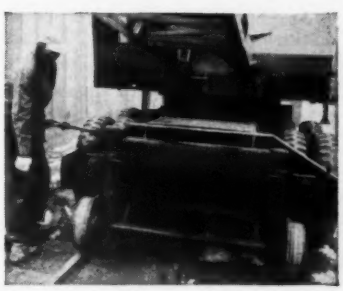
Three special-committee reports and two standing-committee reports were approved and the convention program finalized.

A "skeleton" program follows:

NEW RAIL-WHEEL MOUNTING GIVES BANTAM TOP VERSATILITY .....ON-TRACK AND OFF!

The fast-moving BANTAM now works almost everywhere! New factory-equipped rubber-tire and dolly rail-wheel combination gives you fast highway and on-track travel virtually anywhere—to handle any job that comes up with the greatest speed and efficiency! BANTAM's new rail-wheel mounting is available on either the BANTAM CR-35 one-man-operated, self-propelled crane shown above handling piles for bridge repairs, or the popular carrier mounted T-35 BANTAM shown in yard work at the left. Easy mobility . . . permit-free size . . . precise mechanical controls . . . and 11 fast-change attachments which equip you for all lifting, loading, handling, excavating, pile-driving, erecting jobs—make BANTAM the ideal all-around railway worker and money-saver.

Simple, trouble-free rail-wheel mounting on the BANTAM permits you to drive on or off tracks at any rail crossing with ease. Simple retract dolly device front and rear allows the operator to raise or lower rail wheels in minutes. Offers accurate tracking in either direction, maximum stability. One low-cost BANTAM gives you the service of many less versatile machines!



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motor graders

for right-of-way maintenance

The Huber-Warco 5D-190 MOTOR GRADER is playing an important part in the railroad right-of-way maintenance for some of America's modern railroads. This approach to the use of off the track rubber-mounted equipment means there is no work stoppage . . . trains roll by without delay. The Huber-Warco 5D-190, with a 195 h.p. diesel engine, torque converter, tail-shaft governor and power-shift transmission, can handle a bigger volume of work with fewer passes. The cab-controlled blade movement makes bank-sloping easy. The 360° blade rotation permits a back-up pass . . . there's no need to "dead-head" the grader back for another forward pass. There are many other important bonus features of the 5D-190 that makes every grading job more profitable. See your Huber-Warco distributor for more details on the 5D-190 and other torque converter and standard transmission graders ranging from 75 to 195 h.p.

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HUBER WARCO

Association News (Cont'd)

Monday, September 15

10:00 am-12:00 noon—Joint session
Greetings from representatives of other associations
Address by R. G. May, vice-president, Operations and Maintenance Department, AAR
Address by Clark Hungerford, president, St. Louis-San Francisco

2:00-4:00 pm—Both associations will hold separate sessions

Tuesday, September 16

9:30-12:00 noon—Both associations will hold separate sessions

2:00 pm-4:00 pm—Joint session
Address by C. J. Fitzpatrick, president, Chicago & North Western
Moving picture "Operation Fill," showing construction of embankment across Great Salt Lake, with introduction by H. M. Williamson, engineer maintenance of way and structures, Southern Pacific

6:30 pm—Annual banquet with supply associations

Wednesday, September 17

9:30 am to 12:00 noon—Both associations will hold separate sessions

Afternoon—Both associations will make inspection trips.
The Roadmasters' group will inspect the plant of the Pettibone Mulliken Corporation. Details of the B. & B. inspection trip will be announced later.

Supply Trade News

AMERICAN HOIST & DERRICK—Patrick Bradley has been appointed manager of distributor sales of this company, according to an announcement by **Richard J. Mills,** general sales manager. Mr. Bradley has served with American Hoist since 1951 when he joined the company as a district representative, assisting with distributor sales and holding sales training schools throughout the United States and Canada.

A. M. BYERS COMPANY—John G. Cumming has been appointed manager of the company's southwestern division, with headquarters at Houston, Tex. Mr. Cumming has been with the Byers Company as a field service engineer in New Jersey, working

Patrick Bradley
American Hoist

John G. Cumming
A. M. Byers

Agri-Quip LP-GAS WEED FLAMER SETS RECORD LOW... $7.46 per mile

In the editorial section of this issue you will find the record of an Agri-Quip LP-Gas Flamer... a record that proves the economy and effectiveness of LP-Gas Flaming for controlling and clearing weeds from road bed and areas adjacent to right-of-way.

LP-Gas Flaming is fast, safe and clean; leaves no hazardous oily residues; destroys all weed growth immediately; prevents re-seeding and spreading; prevents erosion by preserving desirable sod conditions.

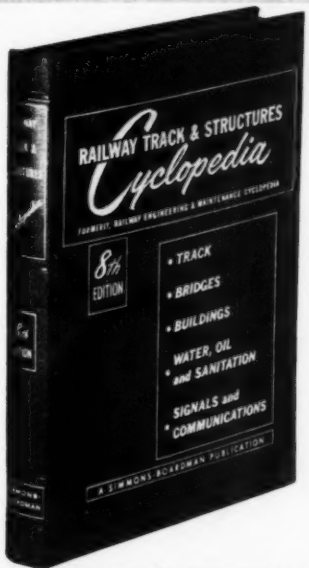
Agri-Quip builds an LP-Gas Flamer especially designed for use by railroads, the WR-200. This unit can be towed by any 12-25 H.P. motor car.

For information on the WR-200 or conversion units, write . . .

The Agricultural Equipment Corp.
La Junta, Colorado

MODEL 240 CUSTOM CONVERSION WEED FLAMER

LP-GAS FLAMING CUTS WEED CONTROL COSTS



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Newest 8th edition— $5.00 to railroad men*

Written by and for railroaders in cooperation with the AREA and the AAR Signal Section, this industry-accepted reference is indispensable to engineering and signaling officers, supervisors, maintenance men, purchasing agents and all other interested railroaders. Its 854 generously illustrated pages give you information on every phase of engineering and maintenance, signals and communications and other details regarding the railroads' fixed property. Six sections totalling 80 chapters include: Track; Signals; Water, Oil and Sanitation; Buildings; Bridges and a General Section. Directory of products and index of trade names in addition to general subject index.

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out of the firm's New York division office.

This company has also announced the appointment of 10 field service engineers, as follows: **R. E. Beisler** and **R. Spurgin,** Chicago; **N. J. Cremonese,** Silver Springs, Md.; **G. F. Grey** and **W. O. Williams,** Houston, Tex.; **M. E. Hanley,** New York; **L. H. Hawks,** Boston; **E. M. Jones,** Pensacola, Fla.; **K. E. MacDonald,** Cleveland; and **L. L. Swaney,** Pittsburgh.

BUCYRUS-ERIE—Charles Parthum has been appointed sales promotion manager. Mr. Parthum was formerly with the Harnischfeger Corporation, where for the last two years he has served as director of public relations, sales promotion and advertising. A graduate of the University of Michigan and of the University of Rochester, Mr. Parthum served during World War II as an officer in the U.S. Army. After the war he joined MacManus, John & Adams, advertising agency, as account executive for the Dow Chemical Company. In 1952, he went with the Buchen Company, a Chicago advertising agency.

COLORADO FUEL & IRON CORP.—Charles R. Tyson has been elected executive vice-president. Mr. Tyson is also executive vice-president of John A. Roebling's Sons Corporation, a wholly owned subsidiary of CF&I, with headquarters at Trenton, N. J. He had been president of the Roebling concern prior to its acquisition by CF&I in December 1952. Mr. Tyson resides at Philadelphia, Pa.

D. W. HALLBERG CO. (CORRECTION)—An announcement in the July issue, stating that this company had recently expanded its facilities, gave its new address incorrectly. The correct address is 1026 Federal Trust Building, 24 Commerce Street, Newark 2, N. J.

KOEHRING COMPANY—This company has purchased for cash the business of **Ka-Mo Tools, Inc.,** Cicero, Ill., manufacturer of special earth-drilling and boring equipment. The purchase also includes the right to use the name, Ka-Mo tools. The new acquisition will become a department of Kwik-Mix Company, a division of the Koehring Company. **C. Kandle,** founder of Ka-Mo Tools Company, will remain in a consulting and advisory capacity. **W. H. Lay** has been named sales manager and **R. E. Henry** becomes works manager.

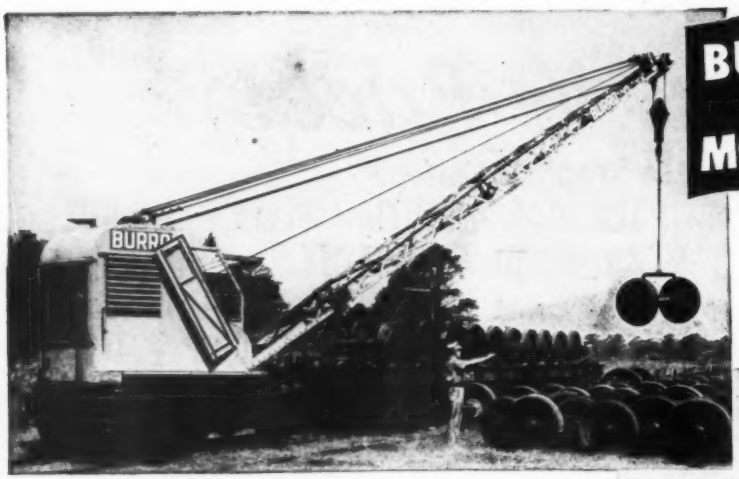
NORDBERG—Edward L. Satola has been appointed advertising manager of Nordberg Manufacturing Company, Milwaukee. Mr. Satola has served on the advertising staff of the company in various capacities for six years. He succeeds **Robert E. Schulz,** who has accepted the position of managing editor of *Diesel Progress* magazine.

SCHIELD BANTAM COMPANY—George H. Maass has been appointed assistant general sales manager with headquarters at Waverly, Iowa, according to an announcement by **Buel M. Wallis,** general sales manager. Mr. Maass comes to Schield Bantam from the LeTourneau-Westinghouse Company, Peoria, Ill., where he had served as assistant export manager.

STANLEY H. SMITH—Effective July 1, **Stanley H. Smith & Co., Inc.,** Cleveland, Ohio, succeeded the former firm bearing the same name, which was not a corporation. Associated with Mr. Smith in the new corporation are Messrs. **E. B. Carpenter,** vice-president and general manager; **James B. Powell,** vice-president and secretary; **E. H. Ricketts, John W. Samson,** vice-presidents; **J. Clark,** sales representative. Mr. Carpenter was formerly associated with the sales department of American Car & Foundry and Mr. Clark with the purchasing department of the Nickel Plate in Cleveland. The new company's address is 2754 Woodhill Road, Cleveland 4, Ohio.

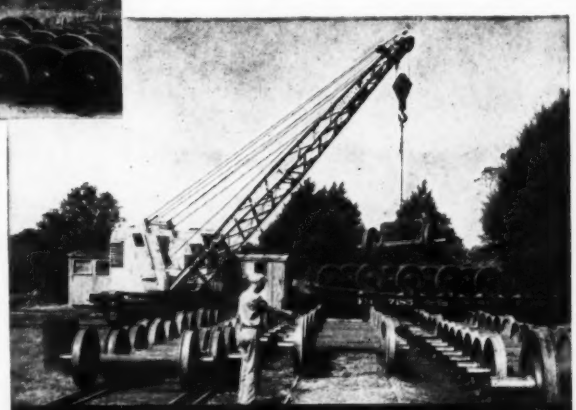
Edward L. Satola
Nordberg

George H. Maass
Schield Bantam



BURRO WORK POWER
means...
MORE EARNING POWER

Unloading car wheels with a Burro. The Burro moved the flat car into position and will haul it away when wheels are unloaded.



This job—handling wheel assemblies in and out of storage—won't support high costs. That's why a Burro is doing the job.

***Any* job—on the line, in the yards, or Stores Department—can be done profitably with a Burro because Burros are fast, efficient workers with hook, magnet, tongs, bucket or dragline. Fast travel speeds and heavy draw bar pull enable the Burro to go to the job in a hurry—and even haul its own cars with it!**

Write for Bulletins and more information about Burro cranes. There is no obligation.

CULLEN-FRIESTEDT CO.,
1301 S. KILBOURN AVE. CHICAGO, ILLINOIS

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POWER BOLT TIGHTENER

Model M.B.T.

For Periodical Maintenance Of Rail Joints

Automatic torque release assures uniform tightness to every bolt.

Adjustable to any desired tension by an automatic kick-out clutch.

One speed design simplifies operation . . . reduces maintenance costs.

Chuck rotation instantly changed through reverse gear. Interchangeable sockets for single standard wrench.

Set-off wheels for quick track clearance.

Thoroughly field tested and approved. Saves original cost in a single season's operation.

Net Weight, 565 Pounds . . . Wisconsin AKN Engine

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Pioneer Manufacturers of Railway Maintenance Equipment Since 1917.

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HOWARD & GOULD *TIE-BORING* TWIST DRILLS

FOR RACO TIE DRILLS

Preferred by the many track departments now using them. Made of the toughest drill steel and designed for PREMIUM PERFORMANCE WITHOUT PREMIUM PRICES.

FOR NORDBERG TIE DRILLS and DUN-RITE GAGING MACHINES

These improved HOWARD & GOULD drill bits have in a short time proved to be the best labor and money savers available for field tie boring. A great amount of breakage is eliminated and less drills are used per job.

Four standard recommended sizes are normally stocked for prompt delivery. Non-standards up to size ⅝" x 12" supplied on short order.

Bulletin on request.

Howard & Gould Company
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. . . easy-rolling transport for ties, rails, tools and supplies

2000 pounds capacity. Takes tools and supplies to the job from truck or bus. All-tubular high-carbon steel construction, designed to safely carry heavy loads of ties, rails, supplies and tools.
The car breaks conveniently in the center into two sections for easy handling and transportation. Easily and quickly unhooked or hooked together. Each section can be used for a truck seat.
The deck is heavy mesh-expanded steel. Removable handle can be used at either end. Ball bearing cast steel wheels.

Platform Size 48" x 45" Height Above Rail 8"
Weight 140 lbs. complete

NOLAN

NOLAN TRACK DOLLY

The fast, safe, easy way to transport heavy rails, ties, supplies, tools, rerailers, etc. Tubular high-carbon steel construction. The deck is heavy mesh-expanded steel. Removable handle.

STANDARD DOLLY

Length	Width	Ht. above Rail	Weight
50½ in.	15½ in.	6⅝ in.	88 lbs.

INSPECTOR'S DOLLY

36 in.	14 in.	6 in.	60 lbs.

Write for complete railway supply catalog.

THE NOLAN COMPANY
166 Pennsylvania St., Bowerston, Ohio

Q & C Car Stops Save Track Space

Q & C Car Stops are very economical because a minimum of labor is required for application. The shock of wheels striking the stop is absorbed by the wedge feature. No drilling is necessary and one size is suitable for all sections of rail used in yards and side tracks.

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Specify them on your requisitions for early delivery.

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JOB: Move 1½ million cu. yd. for the Northern Pacific

WHEELED EQUIPMENT: 3 DW21s

RESULT: "We're on schedule because the DW21s have plenty of power and traction. They maneuver better than anything their size." Hugh G. King, President, Bud King Construction Co., Missoula, Montana

Big, fast-moving Cat DW21 wheel Tractors look their best on the tough jobs. This is one. Bud King Construction is moving 1½ million cu. yd. to relocate 19.5 miles of Northern Pacific line in Montana. When the job started, equipment was half under mud. Excavation included everything from rock to clay.

"I like the traction and flotation of the DW21s on this soft ground," says Mr. King. "We had them on clay slopes where any other machine would have either bogged down or been too awkward to handle."

And here's important news. Now the Caterpillar DW21 is even more powerful, efficient and productive. There's a new 320 HP (maximum output) Super-Turbo Engine in the new model (Series D). This engine has excellent torque characteristics—resulting in rapid acceleration and good gradeability. And the DW21 hits top speed of 22.6 MPH quickly. Matched with the Caterpillar No. 470 LOWBOWL Scraper, the unit loads to its rating fast—18 cu. yd. struck, 25 heaped.

This is important new economy and production for the big, tough off-track jobs. Have your Caterpillar Dealer give you an eye-opening demonstration of the new DW21 on your next job. It's so fast, strong and efficient, it has to be seen in action to be believed.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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3. CLEAN TO HANDLE — Construction and maintenance supervisors know that workmen handle clean wood faster, more efficiently — and with fewer kicks!

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